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ABSTRACT

The potential of telecommunications technology as an aid to rural education in the U.S. was examined. Information derived from relevant literature, telecommunications project reports, census and demographic data, educational statistics, and field data were utilized to examine the general situation in rural America and the 2 target groups of migrant farm workers and American Indians. Educational projects utilizing telecommunications in connection with the target groups were examined and then analyzed in terms of cost, effectiveness, quality, impact, and organizational control. Five separate elements were examined: (1) the physical setting and the population; (2) the problems and questions; (3) the forces, factors, and institutions; (4) the technology; and (5) the technological capability. It was concluded that telecommunications has much to offer in terms of resource-sharing, having the ability to reach physically isolated populations; to teach and upgrade rural teachers; to share good teachers; to bring quality audio and visual information to schools; to teach in bilingual, bicultural situations, and to share administrative duties. Projected large-scale satellite-based educational telecommunications systems were found to be relatively inexpensive, costing no more than $35 per student school year. (JC)

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# TELECOMMUNICATIONS TECHNOLOGY AND RURAL EDUCATION IN THE UNITED STATES

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CENTER FOR DEVELOPMENT TECHNOLOGY

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PROGRAM IN TECHNOLOGY AND HUMAN AFFAIRS

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After all is said and done, I am responsible for the content and views contained herein.

# TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS . . . . . . . . . . . . . . . . . . . . . . . . ii

LIST OF TABLES. . . . . . . . . . . . . . . . . . . . . . . . . x

LIST OF FIGURES . . . . . . . . . . . . . . . . . . . . . . . . xiii

Chapter

I. INTRODUCTION: PURPOSE AND SCOPE OF INVESTIGATION . . . 1

  Introduction and Background . . . . . . . . . . . . . . 1

    Element 1: The Physical Setting and the Population. . . . . . . . . . . . . . . . . . . . . . 2

    Element 2: The Problems and the Questions. . . . . 3

    Element 3: The Forces, Factors and Institutions. . 4

    Element 4: The Technology. . . . . . . . . . . . . 5

    Element 5: Technological Capability. . . . . . . . 5

  Approach and Scope of Thesis. . . . . . . . . . . . . 6

  Background and Fieldwork. . . . . . . . . . . . . . . 7

  Footnotes . . . . . . . . . . . . . . . . . . . . . . 9

II. AN OVERVIEW OF RURAL AMERICA AND RURAL EDUCATION. . . . 10

  Introduction. . . . . . . . . . . . . . . . . . . . . 10

    Definition of Rural . . . . . . . . . . . . . . . . 10

  Demography of Rural America . . . . . . . . . . . . . 14

    Rural Census by Region and State. . . . . . . . . . 14

    Dependency Ratio. . . . . . . . . . . . . . . . . . 15

    Rural Poverty . . . . . . . . . . . . . . . . . . . 20

Chapter Page

Per Capita Income . . . . . . . . . . . . . . . . . . 22

Culturally Diverse Groups . . . . . . . . . . . . . . 25

Rural Blacks. . . . . . . . . . . . . . . . . . . . . 26

Spanish Origin, Surname or Heritage Population. . . 28

Spanish Rural Population. . . . . . . . . . . . . . . 28

Rural Whites. . . . . . . . . . . . . . . . . . . . . 32

Rural Education . . . . . . . . . . . . . . . . . . . . 32

Definition. . . . . . . . . . . . . . . . . . . . . . 33

Educational Attainment. . . . . . . . . . . . . . . . 34

Census of Schools, Students, Teachers . . . . . . . 35

Number of Schools . . . . . . . . . . . . . . . . . . 42

Rural Student Density . . . . . . . . . . . . . . . . 45

Expenditures for Education. . . . . . . . . . . . . . 46

Rural Expenditures Per Student. . . . . . . . . . . . 55

Characteristics of Disadvantaged Rural Students . . 57

Summary . . . . . . . . . . . . . . . . . . . . . . . . 58

Footnotes . . . . . . . . . . . . . . . . . . . . . . . 61

III. AMERICAN INDIANS, INDIAN EDUCATION, AND INDIAN TELECOMMUNICATION PROJECTS. . . . . . . . . . . . . . . . 64

Introduction. . . . . . . . . . . . . . . . . . . . . . 64

Indian Census, Demographics, Tribes and Languages . . 65

Census. . . . . . . . . . . . . . . . . . . . . . . . 65

Tribes. . . . . . . . . . . . . . . . . . . . . . . . 66

Rural and Urban Indian Distribution . . . . . . . . 71

Reservation Dwellers. . . . . . . . . . . . . . . . . 72

Chapter Page

Language Spoken by Indians. . . . . . . . . . . . . . 73

Age Distribution, Dependency Ratio, Family Size . . 76

Indian Employment, Income and Poverty Status. . . . 78

History, Legal Situation, Special Status. . . . . . 80

Indian Education, Status and Issues . . . . . . . . . 86

Educational Attainment. . . . . . . . . . . . . . . 87

Types of Schools for Indians. . . . . . . . . . . . 87

Funding of Indian Education . . . . . . . . . . . . 91

Characteristics of Indian Students. . . . . . . . . 93

Educational Disadvantages of Indians. . . . . . . . 95

Achievement by Standardized Tests . . . . . . . . . 96

Overageness . . . . . . . . . . . . . . . . . . . . 98

Teachers of Indian Children . . . . . . . . . . . . 98

Indian Education Telecommunications Projects. . . . . 104

Ramah Radio Project . . . . . . . . . . . . . . . . 104

Isleta C.A.I. Project . . . . . . . . . . . . . . . 108

Jicarilla Closed Circuit TV . . . . . . . . . . . . 110

Tribal Telecommunications . . . . . . . . . . . . . . 111

Navajo Communications/Education Development . . . . . 111

Pueblo Telecommunications . . . . . . . . . . . . . . 112

Other Telecommunications Projects . . . . . . . . . . 113

Summary . . . . . . . . . . . . . . . . . . . . . . . 113

Footnotes . . . . . . . . . . . . . . . . . . . . . . 115

IV. MIGRATORY FARM WORKERS, MIGRANT EDUCATION, AND MIGRANT TELECOMMUNICATIONS PROJECTS . . . . . . . . . . 119

Chapter Page

Introduction . . . . . . . . . . . . . . . . . 119

Migratory Farm Worker's Role in the Economy and Position in Society . . . . . . . . . . 119

Introduction . . . . . . . . . . . . . . . . 119

History of Migrant Farm Labor . . . . . . . . . 121

Definition of Migrant . . . . . . . . . . . . 122

Income . . . . . . . . . . . . . . . . . . . 124

Health . . . . . . . . . . . . . . . . . . . 125

Census, Streams, Groups, Movement . . . . . . . . 126

Total Number of Migrants . . . . . . . . . . . 126

Movement Patterns . . . . . . . . . . . . . . 134

Crew Size . . . . . . . . . . . . . . . . . 143

Family Size . . . . . . . . . . . . . . . . 144

Age . . . . . . . . . . . . . . . . . . . . 144

S

Employer Configurations, Recent Labor Needs, Entrepreneurship Patterns, Future Outlook . . . . 145

Decline in Need . . . . . . . . . . . . . . . 147

Employers of Migratory Farm Workers . . . . . . 148

The Future Outlook for Migrants . . . . . . . . 152

Educational Attainment of Migrants, Present Education Programs and Funding of Migrant Education . . . . . 154

Introduction and Definition . . . . . . . . . . 154

Educational Attainment Levels of Migrants . . . . . 155

Number of Migrant School Children . . . . . . . . 156

Number of Schools Serving Migrants . . . . . . . . 156

Number of School Children on the Road . . . . . . 157

Chapter Page

Funding . . . . . . . . . . . . . . . . . . . . . . . . . 158

Migrant Student Characteristics and Educational Needs . . . . . . . . . . . . . . . . . 159

Present Migrant Education Programs. . . . . . . . . . 161

Survey of Educational Needs of Adult Migrants . . . 166

Migrant Educational Telecommunications Projects . . . 167

Introduction. . . . . . . . . . . . . . . . . . . . . 167

Project Move Ahead. . . . . . . . . . . . . . . . . . 168

FM Radio Project, Florida . . . . . . . . . . . . . 170

Program VI; Video Project for Migrant Education . . . . . . . . . . . . . . . . . . . . . 173

Migrant Student Record Transfer System. . . . . . . 177

TESOL-Visual Library, A Non-Mediated Project. . . . 181

Carrascolendas: Bilingual Education Through Television. . . . . . . . . . . . . . . . . . . . 183

Summary . . . . . . . . . . . . . . . . . . . . . . . . 185

Footnotes . . . . . . . . . . . . . . . . . . . . . . . 191

V. EDUCATIONAL COMMUNICATIONS SATELLITE PROJECTS . . . . . 201

Introduction. . . . . . . . . . . . . . . . . . . . . . 201

ATS-1 Alaskan Village Satellite Project . . . . . . . 202

ATS-6 Regional Education Experiments. . . . . . . . . . 205

Alaskan ATS-6 Education Experiments . . . . . . . . 208

Appalachian ATS-6 Education Experiments . . . . . . 211

Rocky Mountain ATS-6 Education Experiments. . . . . 214

Summary and Comments on ATS Education Projects. . . . 217

Footnotes . . . . . . . . . . . . . . . . . . . . . . . 221

Chapter Page

VI. ANALYSIS OF SELECTED ASPECTS OF RURAL EDUCATIONAL TELECOMMUNICATIONS . . . . . . . . . . . . . . . . . . . . 224

Introduction. . . . . . . . . . . . . . . . . . . . . . . . 224

Costs of Large-Scale Telecommunications for Rural Education . . . . . . . . . . . . . . . . . . 225

A Simplified Model for Costing. . . . . . . . . . . . 225

Illustrative Systems. . . . . . . . . . . . . . . . . 229

Illustrative System A . . . . . . . . . . . . . . . . 229

Illustrative System B . . . . . . . . . . . . . . . . 229

Illustrative System C . . . . . . . . . . . . . . . . 232

Illustrative System D . . . . . . . . . . . . . . . . 232

Discussion and Limitations of Cost Analysis . . . . 233

Organizational Structure. . . . . . . . . . . . . . . . 236

Smaller-Scale Telecommunications Alternatives . . . . 239

Summary and Conclusions . . . . . . . . . . . . . . . 241

Footnotes . . . . . . . . . . . . . . . . . . . . . . . 244

VII. CONCLUSIONS . . . . . . . . . . . . . . . . . . . . . . 246

Introduction. . . . . . . . . . . . . . . . . . . . . . . 246

Resource-Sharing and Telecommunications . . . . . . . 249

Footnotes . . . . . . . . . . . . . . . . . . . . . . . 253

BIBLIOGRAPHY. . . . . . . . . . . . . . . . . . . . . . . . . 254

APPENDIX. . . . . . . . . . . . . . . . . . . . . . . . . . 266

# LIST OF TABLES

Table | Page
--- | ---

1. Total, Urban and Rural Census, United States: 1970. . . 11
2. Goldmark's Small Cities Population Model of Rural Areas . . . . . . . . . . . . . . . . . . . . . . . . . 13
3. Urban and Rural Residence By Race and by Regions: 1970. . . . . . . . . . . . . . . . . . . . . . . . . 16
4. State By State Listing of Rural Population, Listed In Descending Order By Percentage of Rural Population: 1970 . . . . . . . . . . . . . . . . . . . . 17
5. States in Order of Population Density . . . . . . . . . . 19
6. Dependency Ratios of Those Under 18 and Over 65 on Population 18 to 65: 1970. . . . . . . . . . . . . . . . 21
7. Per Capita Income and Poverty Status By Urban And Rural Residence and Race: 1970 . . . . . . . . . . 23
8. Synopsis of Black Population in U.S.: 1970 . . . . . . 27
9. Spanish Rural Population by Origin. . . . . . . . . . . 30
10. Spanish Language Spoken By People of Spanish Heritage, Urban and Rural: 1970. . . . . . . . . . . . . . . . . . 31
11. Rural Population Census By Group With Percentage: 1970 . . . . . . . . . . . . . . . . . . . . 33
12. Educational Attainment of Persons 25 or over Expressed in Years of Schooling Completed For Urban and Rural Areas, U.S.: 1970. . . . . . . . . . 36
13. State By State Census, Rural Population, School Enrollment (Age 3-34) and Rural School Enrollment: 1970 . . . . . . . . . . . . . . . . . . . . 37
14. Number of Teachers, Students, Schools, Districts and Expenditures for Public Elementary and Secondary Schools 1930-1970 . . . . . . . . . . . . . . . . . . . 41

Table Page

15. Number of Public School Systems and Number of Pupils Enrolled, By Size of System: United States, 1966-67 . . . . . . . . . . . . . . . . . . . . 43

16. Public School Density for the Rural Population By State: 1970 . . . . . . . . . . . . . . . . . . . . 47

17. Gross National Product (GNP), Expenditures for Education, and Expenditures as a Percent of GNP 1930 to 1970. . . . . . . . . . . . . . . . . . . . . . 51

18. Total Personal Income, Per Capita Income and Expenditure Per Pupil in Public Elementary and Secondary Day Schools, By States: 1971 . . . . . . . 53

19. Average Cost Per Pupil According to School Population: 1970 . . . . . . . . . . . . . . . . . . . 56

20. Indian Population by State: 1970 and 1960. . . . . . . 67

21. Indian Tribal Distribution: 1970 . . . . . . . . . . . 69

22. Urban Indian Population in 16 Major Cities: 1970 . . . 72

23. Distribution of Indian Tribes on Reservations . . . . . 74

24. Languages Listed By All Indians as Mother Tongue. . . . 75

25. Five Most Spoken Languages By Indians Residing on Reservations. . . . . . . . . . . . . . . . . . . . . . 77

26. Employed Indians By Type of Industry: 1970 . . . . . . 79

27. Indian Per Capita Income and Poverty Status: 1970. . . 81

28. General Indian Population Statistics: 1970. . . . . . . 82

29. Time Chart of Important Events Related to Indian Education . . . . . . . . . . . . . . . . . . . . . . . . 83

30. Types of Schools and Enrollments of Indians Aged 5-18: 1972 . . . . . . . . . . . . . . . . . . . . . . . . 88

31. Tribes With Over 1,000 Students Enrolled in B.I.A. Schools, in Decending Order: 1972. . . . . . . . . . . . 92

32. Funding of Indian Education: 1969. . . . . . . . . . . . 94

Table Page

33. Employment of Seasonal and Migrant Hired Agricultural Workers, By Type of Worker: 1971 . . . . . . . . . . . 127

34. Peak Employment and Period of Employment of Domestic Migratory Workers in Agriculture, States Which Used Migratory Workers: 1971 . . . . . . . . . . 129

35. Peak Seasonal Employment By Major Crop: 1971 . . . . . 133

36. Percentage of Vegetables, Fruits, and Nuts Machine Harvested in 1968 . . . . . . . . . . . . . . . . . . . 146

37. U.S. Department of Agriculture Census of Farm Workers and Domestic Migratory Farm Workers: 1949-1971 . . . 149

38. Programs Benefitting Migratory Pupils in Florida: 1969. . . . . . . . . . . . . . . . . . . . . 165

39. Illustrative Satellite-Based Telecommunications Systems for Rural Education . . . . . . . . . . . . . 230

40. Results of Cost Calculations Based on Illustrative Satellite-Based Telecommunications Systems for Rural Education . . . . . . . . . . . . . . . . . . . . 231

# LIST OF FIGURES

Figure — Page

1. Density of Rural Public School Students Per Square Mile, By State With Density Grouping: 1970 . . . . . . . . . . . . . . . . . . . . . . 50
2. Location of Indian Tribes . . . . . . . . . . . . . . . . . 70
3. School Achievement of Indian Pupils According to Five Research Studies . . . . . . . . . . . . . . . . . 97
4. Seasonal Hired Farm Employed: 1960 . . . . . . . . . . 131
5. Seasonal Map Showing Counties With Over 100 Migratory Farm Workers, Season: Spring . . . . . . . . . . . . . 135
6. Seasonal Map Showing Counties With Over 100 Migratory Farm Workers, Season: Summer . . . . . . . . . . . . . 136
7. Seasonal Map Showing Counties With Over 100 Migratory Farm Workers, Season: Fall . . . . . . . . . . . . . . 137
8. Seasonal Map Showing Counties With Over 100 Migratory Farm Workers, Season: Winter . . . . . . . . . . . . . 138
9. Peak Employment of Domestic Migrant Farmworkers By State: 1971 . . . . . . . . . . . . . . . . . . . . . 139
10. Travel Patterns of Seasonal Migratory Agricultural Workers . . . . . . . . . . . . . . . . . . . . . . . . . 141
11. Texas Migrant Yearly Travel Patterns: 1970 . . . . . . 142
12. Graphs Showing Percentage of Farms Hiring Labor In Categories of Time and Money: 1969 . . . . . . . . . . 151
13. Administrative Organization of Pilot V: 1973 . . . . . 175

## CHAPTER I

## INTRODUCTION: PURPOSE AND SCOPE OF INVESTIGATION

> "Our global civilization will be shaped more by the activity and content of its classrooms, books, and television screens than by its forges and factories." (1)

### Introduction and Background

The central question in this thesis is whether telecommunications technology, in its various physical forms can augment the development of rural education in the United States. In order to pursue this question, information from a variety of sources was analyzed to assess the present and potential future interface of telecommunications technology and rural education. Sources included relevant literature, telecommunications project reports, census and demographic data, educational statistics, and data from field visits.

The approach used in this investigation was first to examine the general situation in rural America, with emphasis on rural education. Two target groups, migrant farm workers and American Indians were then singled out for further study. Educational projects utilizing telecommunications in connection with the target groups were examined. This was followed by an analysis which considers costs, effectiveness, quality, impacts, and organizational control of telecommunications technology projects for rural education.

Interest in the use of telecommunications for rural education has been stimulated by the National Aeronautics and Space

Administration's Application Technology Satellite (ATS) Series. The most recent satellite in the series, the sixth, ATS-6, is now in orbit and is being used for many experiments, including some involving education in selected rural regions. The ATS-6 satellite, although experimental in nature, will be used to demonstrate the kinds of services that telecommunications technology may be able to provide in future operational systems. (2)

In considering the question of whether telecommunications technology can help improve rural education in the United States, this thesis will examine five separate but interrelated elements:

1. The physical and geographic setting and the population to be served.
2. The problems that exist, or the questions that need answering.
3. The forces, factors, and social institutions that are presently in existence.
4. The technology.
5. The technological capability or technique which results from combining the technological hardware with social systems in a manner needed to utilize the technology in a beneficial manner. Included is consideration of the organizational and administrative structures needed.

## Element 1: The Physical Setting and the Population

The setting for investigation in this report is rural America, which encompases geographically all but about 10 percent (3) of the land area of the United States and part of every state. The population living in rural America totalled almost 54 million according to the 1970 Census, which is one-quarter of the total U.S. population. Included in this population are numerous individuals from minority groups. About 15 million rural residents are enrolled in school (4). Much of rural America is isolated from mainstream America and urban America.

In addition to rural America in general, this report will examine two groups found within the rural setting: American Indians, totalling slightly less than one million (5) and living in every state but concentrated in Western states, often on reservations; and migratory farm laborers, who migrate north and south in "streams" to harvest crops. For the latter group, their numbers are estimated to total less than one million, but firm statistics are not available. Each group has special problems and educational needs which are examined in this thesis.

## Element 2: The Problems and the Questions

Isolation is one of the major descriptive words for rural America. The main flow of money, jobs, resources and education occurs in the urban and suburban sectors. The people that compose the two target groups in this report are dispersed, thus making development assistance efforts difficult. Some moves toward self development are being made, through the efforts of migrant groups such as The United Farm Workers; and Indian groups such as AIM, The National Congress of American Indians, National Indian Youth Council and The National Tribal Chairmen's Association.

The economic resources of rural areas, and especially of the target groups, are low in relation to the magnitude of their problems.

In addition to financial needs, rural areas often suffer from fewer services, fewer trained and specialized people, and fewer goods and amenities than suburban or urban areas.

The educational attainment of the target groups is far below the national average and the quality of what education they do get does not seem to prepare them adequately for today's employment market. Costs for education are high and access to education for many of the persons in the target groups is difficult for a variety of reasons to be discussed in subsequent chapters. With telecommunications, the possibility arises of creating a "classroom" of widely dispersed rural students or a network of users to overcome some or all of these conditions. Whether in fact this can be accomplished will be explored in this thesis.

### Element 3: The Forces, Factors and Institutions

There are a number of factors that influence the direction, scope and future of education for rural America in general as well as for specific groups of primary interest in this thesis, i.e. American Indians and migrants. These factors include: land ownership patterns, laws that govern these rural groups, and federal support for Indian and migrant education. Other factors include the emergence of the "Indian Power" movement, the farm labor unionization movement, and social and economic forces that mitigate against equal progress in education. These forces must be examined in addition to educational needs because they help to define the social system in which telecommunications technology must operate.

## Element 4: The Technology

Telecommunications technology hardware includes components of systems utilizing electronics to distribute information which is sent and displayed in a number of ways. Telecommunications equipment can be interconnected to form networks to bring educational and instructional services to geographically dispersed areas. These services include computer-aided instruction, and educational television and radio programs. Possible transmission technologies to be incorporated into networks for delivering these services might include communications satellites, microwave, cable, telephone lines, as well as mailing of films and both video and audio cassettes.

## Element 5: Technological Capability

In considering the use of telecommunications technology for rural education: "It is necessary, first, to distinguish technology from technological capability; the former refers primarily to hardware and its evolution, while the latter is intended to include the complex of human and organizational skills which act on hardware to produce a capability. If this distinction is acknowledged, then technology is more concerned with the economic, political, and social consequences of a developing technological capability rather than technology." (6) Recognizing technological capability as an essential prerequisite to technology utilization, one is then led to a definition of instructional technology that focuses on the development and utilization of programming and on organizational structures as well as on the hardware.

Technology development has progressed much faster than technological capability. It is now technically possible to blanket the whole country with a satellite relayed signal but we witness separate, autonomous schools in isolated areas continuing age old methods of teaching. We are faced with questions of adaptability, compatability, costs, financing, coordination of educational programs, and teacher acceptability, when considering the interface of telecommunications and rural education. These issues will be addressed in this investigation.

## Approach and Scope of Thesis

The objective then, of the following chapters is to appraise the potential of using telecommunications technology to meet educational needs of migratory farm workers, American Indians and other rural residents of the United States. This will be accomplished by examining the needs of the target groups along with the opportunities for utilizing telecommunications technology.

In Chapter II, information is developed on the rural America setting in general and rural education in particular. Attention is focused upon census data and demographics, characteristics of groups living in rural America and of current rural education, and statistics concerning current and projected educational enrollments and costs.

Chapters III and IV concentrate on two groups with strong although not exclusive rural identification. Chapter III focuses on American Indians; their numbers, unique status, and educational situation. Chapter IV examines migratory farm workers again isolating the factors that make them unique and seeking to identify their educational needs. The problems of each of the target groups are analyzed in terms of factors working against present educational strategies. Specific educational projects which utilize telecommunications technology are described, discussed and analysed for each target group.

In Chapter V large-scale satellite-based educational telecommunications projects are described and discussed. This chapter is predominantly concerned with the specific educational and organizational experiments being conducted in the ATS-6 regional education projects.

Chapter VI discusses several aspects necessary to develop educational telecommunications systems. Costs and organizational structure are the main foci of discussion in the chapter. Overall conclusions drawn from the study are presented in Chapter VII.

## Background and Fieldwork

This study was not written without some degree of personal contact with migrant farm workers and Indians, the two groups under special focus. During his undergraduate study, the author lived with migratory farm workers of the "East Coast Stream" as a participant-observer in upstate New York and migrated to Florida with his "crew." A written document (7) was produced following that field experience. Subsequently the author was employed by the State of New Jersey in a capacity that allowed him to make site visits to migrant health clinics, migrant summer school projects and farm labor placement offices.

A field research trip was made to the Southwest to gather data for this project. The trip had the following goals:

1. To acquaint the author through first hand contact with

Indian education and the Indian reservation setting.

2. To document educational telecommunications projects that were not generally available in the literature.
3. To gain a perspective on the future of Indian education and affairs.

In order to accomplish this, the author made site visits to Indian schools, and educational telecommunication projects involving Indians in October, 1973 (see Appendix for itinerary). He also met with Indian leaders, government officials and project personnel.

Extensive literature does not exist on the topic of central concern in this thesis. Two studies which are somewhat related because of the telecommunications element include a project entitled "The New Rural Society" by Goldmark (8) and another comparative study of instructional television usage among the target groups in the U.S. and in foreign cultures by the Developmental Educational Training Research Institute (9). These studies are mentioned briefly in Chapter VII.

# FOOTNOTES

## Chapter I

1. Glenn T. Seaborg, "Science, Technology and Development: A New World Outlook," SCIENCE, Vol. 181,.No. 4094, (6 July 1973) pg. 18.

2. "Health-Education Telecommunications Experiment (HET): Experiment Summary Description," (Washington, D.C.: Dept. of H.E.W. and N.A.S.A., Nov. 1, 1973).

3. Peter C. Goldmark, "Communications For a New Rural Society," Journal of the SMPTE, Vol. 81, (July 1972) 513.

4. U.S., Department of Commerce, Bureau of the Census, 1970 Census of Population, Subject Report PC(2)-54: School Enrollment (Washington, D.C.: Government Printing Office).

5. Ibid., Subject Report PC(2)-IF: Indian Americans.

6. Michael Gibbons and Roger Voyer, "Technology Assessment: Bias-Free Analysis," New Scientist, New Science Publications, London, Vol. 58, No. 847, (24 May 1973), 466.

7. Jay Randal Perrine, "Negroes Between Crops and Whites: A Cultural Study of Negro Migratory Farm Workers of the East Coast Stream," (Bachelor's Thesis, Goddard College) Copyright June, 1969.

8. Peter C. Goldmark, op. cit.

9. Eva Mackin and others, ITV and Education of Children of Migratory Farm Workers, Indians, and Inner City Poor: Cross-Cultural Comparisons of International Uses of Media (Washington, D.C.: Developmental Education and Training Research Institute (DETRI), The American University, January 1971).

# CHAPTER II

# AN OVERVIEW OF RURAL AMERICA AND RURAL EDUCATION

## Introduction

This chapter presents an overview of rural America and rural education. Demographic and population data are presented for rural areas, including educational attainment, extent of poverty, and statistics on minority groups in rural areas. Education in rural America will be described in terms of numbers of students, teachers, and the density of students by state. A brief description will be made of rural schools and general rural education problems. The combination of the statistical material plus the descriptions are expected to give an overview of the situation in respect to rural America before analyzing the target groups in Chapters III and IV.

## Definition of Rural

This study, and other sources used for this study rely on the U.S. Census for statistics. The 1970 Census defines rural as all incorporated or unincorporated places of less than 2,500 persons, rural in character, that are not included in urbanized areas. (1) Based on this definition of rural, the population of 13,706 places plus other rural areas was 53,886,996 in 1970 (2)

The Census generally presents data under the two sectors of "urban" and "rural". Upon examination of Table 1 it can be found

## TABLE 1

## TOTAL, URBAN AND RURAL CENSUS, UNITED STATES: 1970

| Sector | Place | Population |
|---|---|---|
| United States | 20,768 | 203,211,926 |
| Urban | | |
| Central Cities | 308 | 63,921,684 |
| Urban Fringe | 2,914 | 54,524,882 |
| Outside Urbanized Areas - | 3,840 | 30,878,364 |
| Rural | 13,706 | 53,886,996 |

Source: 1970 Census

that within the Census classification of "urban" are major subdivisions. The subdivision of "inside urban areas" covering 3,222 places and 118 million people, includes the categories of "central cities" and "urban fringe," neither of which are of interest to this study. The subdivision of "outside urbanized areas" covers 3,840 places with 30 million (30,878,364) people. (3) The average population of places "outside urbanized areas" is about 8 thousand inhabitants, ranging from 2,500 to over 25,000. If all of these places are truly outside urbanized areas in relation to amenities and services, including telecommunications then they may well be within the interest of this study. The "outside urbanized areas" and "rural" categories totalled yields 85 million (84,765,360) people. This number might be taken as an upper bound to the rural population, although in this chapter rural will almost exclusively deal with the lower bound figure of 54 million discussed above.

By contrast, a study by Peter C. Goldmark uses quite a different concept of rural in discussing the "New Rural Society." (4) His proposals deal with rural communities starting with those having populations of 2,500 as the smallest and working upwards to populations of 100,000, encompassing a total of 77 million people as shown in Table 2. Interestingly, if Goldmark's "rural" 1970 population of 77 million is added to the rural population of 54 million enumerated in the Census, one arrives at a total of 131 million. This total would comprise 63 percent of the United States population.

Basically the "New Rural Society" as outlined by Goldmark would be created by developing those communities presently containing from 2,500 to 100,000 people and absorbing some 80 million additional

## TABLE 2

## GOLDMARK'S SMALL CITIES POPULATION MODEL OF RURAL AREAS

| City Size by Population | Number of Cities in 1970 | Total Population in 1970 |
|---|---|---|
| 50,000 - 100,000 | 240 | 16,720,000 |
| 25,000 - 50,000 | 520 | 17,850,000 |
| 10,000 - 25,000 | 1385 | 21,420,000 |
| 5,000 - 10,000 | 1839 | 12,920,000 |
| 2,500 - 5,000 | 2295 | 8,040,000 |
| Totals | 6279 | 76,950,000 |

Source: Peter C. Goldmark, "The New Rural Society," Number 5, 1973 University Lecture Series, Cornell University.

people over the next thirty years in these communities. The plan is devised to reduce the movement towards urbanization by making rural areas more attractive places to live. Communications technology plays a key role in the Goldmark scheme. Such developments may well come about but this chapter will concentrate on the present rural population, as defined by the Census, comprising from one-quarter to one-third of the U.S. total living predominately in communities of less than 2,500, often in isolated areas. A less restrictive view will be taken in Chapter V, where large scale rural telecommunications applications are considered.

## Demography of Rural America

Rural Census by Region and State. Rural areas are not composed mainly of farmers. Only 24 percent of the rural population is counted as "Rural farm" by the census. The total "Rural nonfarm" census in 1970 was 43,290,323 and the "Rural farm" census was 10,588,534. (5) A large percentage of the rural population lives in settlements of less than 1,000 persons, or 47,230,989 or 87.6 percent the rural population. (6)

See Table 3 for the population breakdown by region. The Northeast has only an 11.5 percent Rural farm population in its rural sector compared to 40 percent in the North Central Area. The West has 20.4 percent and the South 21.8 percent. (7)

Every state has a rural population. Only one state, California, has less than a 10 percent rural population. Vermont, with 67.9 percent has the highest percentage of rural residents in the urban/rural ratio listing, however it has the smallest rural population in actual numbers. It is instructive to refer to Tables 4 and 5 for comparisons. In Table 4 are found: the percentage of the population of each state that reside in rural areas, the actual rural population as of 1970, and the total state population. By contrast, Table 5 shows the average density of population which is obtained by dividing the census for each state by its area in square miles.

By region, the south has the largest percentage (35.5 percent) and actual number of rural residents of the four major areas in the U.S. (see Table 3). The west has the lowest number of rural residents despite the large land area. The west has the lowest density of rural residents and the northeast the highest.

Tables 4 and 5 show the difference between urbanization of land and urbanization of population. Although most of the people in a state live in cities, most of the land is not especially densely inhabited with people. Often the most urbanized states have large rural areas with distinct rural conditions. Utah, for example, appears as one of the most urbanized areas in Table 4 but one of the least densely populated in Table 5. The size of the rural areas, the total rural population, and the isolation from major urban areas are all important factors.

Dependency ratio. The dependency ratio indicates the number of those who are either too young or too old to work and must, therefore, depend on those between eighteen and sixty-four who are employed. More rural old people and more rural young people than are found proportionately in the urban areas indicates a higher

## TABLE 3

## URBAN AND RURAL RESIDENCE BY RACE AND BY REGIONS: 1970

| Region | Total | Urban | Rural Non Farm | Rural Farm |
|---|---|---|---|---|
| U.S. | 203,212,877 | 149,334,020 | 43,290,323 | 10,588,534 |
| Northeast | 49,044,420 | 39,449,883 | 8,604,510 | 990,027 |
| North Central | 56,566,372 | 40,468,884 | 11,497,710 | 4,599,778 |
| South | 62,793,311 | 40,550,526 | 18,251,399 | 3,991,386 |
| West | 34,808,774 | 28,864,727 | 4,836,704 | 1,007,343 |
| Black | | | | |
| U.S. | 22,549,815 | 18,338,421 | 3,536,974 | 674,420 |
| Northeast | 4,336,913 | 4,208,201 | 119,515 | 9,197 |
| North Central | 4,565,413 | 4,441,685 | 109,374 | 14,354 |
| South | 11,957,055 | 8,050,025 | 3,259,611 | 647,419 |
| West | 1,690,434 | 1,638,510 | 48,474 | 3,450 |
| Spanish Heritage | | | | |
| U.S. | 9,294,500 | 8,156,583 | 961,459 | 176,467 |
| Northeast | 1,206,740 | 1,175,903 | 27,922 | 2,915 |
| North Central | 842,822 | 752,536 | 77,308 | 12,978 |
| South | 2,865,900 | 2,440,847 | 354,705 | 70,348 |
| West | 4,379,047 | 3,787,297 | 501,524 | 90,226 |

Source: 1970 Census

TABLE 4

STATE BY STATE LISTING OF RURAL POPULATION,
LISTED IN DESCENDING ORDER BY PERCENTAGE
OF RURAL POPULATION: 1970

| State | Percentage of Pop. Which is Rural | Rural Population | Total State Population |
|---|---|---|---|
| Vermont | 67.9 | 301,458 | 444,330 |
| West Virginia | 61.0 | 1,064,712 | 1,744,237 |
| North Dakota | 55.7 | 344,119 | 617,761 |
| Mississippi | 55.5 | 1,229,600 | 2,216,912 |
| South Dakota | 55.4 | 368,877 | 665,507 |
| North Carolina | 55.0 | 2,796,538 | 5,082, 059 |
| South Carolina | 52.4 | 1,358,623 | 2,590,516 |
| Alaska | 51.3 | 153,853 | 300,382 |
| Arkansas | 49.9 | 960,839 | 1,923,295 |
| Maine | 49.1 | 487,556 | 993,663 |
| Kentucky | 47.6 | 1,533,261 | 3,218,706 |
| Montana | 46.3 | 322,065 | 694,409 |
| Idaho | 45.7 | 325,467 | 712,567 |
| New Hamsphire | 43.5 | 320,990 | 737,681 |
| Iowa | 42.7 | 1,207,551 | 2,824,376 |
| Alabama | 41.6 | 1,431,592 | 3,444,165 |
| Tennessee | 41.2 | 1,616,980 | 3,923,780 |
| Georgia | 39.7 | 1,822,991 | 4,589,575 |
| Wyoming | 39.6 | 131,539 | 332,416 |
| Nebraska | 38.4 | 569,435 | 1,482,412 |
| Virginia | 36.9 | 1,717,340 | 4,648,494 |
| Indiana | 35.1 | 1,822,659 | 5,193,669 |
| Wisconsin | 34.1 | 1,508,280 | 4,417,731 |
| Louisiana | 33.9 | 1,232,384 | 3,640,490 |
| Kansas | 33.9 | 762,344 | 2,246,578 |
| Minnesota | 33.6 | 1,278,411 | 3,804,971 |
| Oregon | 33.0 | 688,874 | 2,091385 |

## TABLE 4 (cont.)

## STATE BY STATE LISTING OF RURAL POPULATION, LISTED IN DESCENDING ORDER BY PERCENTAGE OF RURAL POPULATION: 1970

| State | Percentage of Pop. Which is Rural | Rural Population | Total State Population |
|---|---|---|---|
| Oklahoma | 32.0 | 818,211 | 2,559,229 |
| New Mexico | 30. | 305,295 | 1,016,000 |
| Missouri | 29.9 | 1,399,685 | 4,676,501 |
| Pennsylvania | 28.6 | 3,366,527 | 11,793,907 |
| Delaware | 27.9 | 152,943 | 548,101 |
| Washington | 27.4 | 932,672 | 3,409,169 |
| Michigan | 26.1 | 2,319,906 | 8,875,083 |
| Ohio | 24.7 | 2,628,673 | 10,651,848 |
| Maryland | 23.3 | 917,501 | 3,923,399 |
| Connecticut | 22.7 | 688,131 | 3,031,709 |
| Colorado | 21.3 | 471,177 | 2,207,259 |
| Arizona | 20.5 | 362,819 | 1,770,900 |
| Texas | 20.2 | 2,266,898 | 11,195,431 |
| Florida | 19.5 | 1,322,372 | 6,789,412 |
| Utah | 19.5 | 205,959 | 1,059,273 |
| Nevada | 19.1 | 93,517 | 488,738 |
| Hawaii | 17.0 | 130,811 | 768,561 |
| Illinois | 17.0 | 1,887,548 | 11,109,935 |
| Massachusetts | 15.4 | 816,184 | 5,689,170 |
| New York | 14.4 | 2,632,536 | 18,236,951 |
| Rhode Island | 13.0 | 123,565 | 948,845 |
| New Jersey | 11.1 | 794,900 | 7,168,164 |
| California | 9.1 | 1,819,999 | 19,957,715 |

Source: 1970 Census

TABLE 5

STATES IN ORDER OF POPULATION DENSITY

| People per sq. mile | State | People per sq. mile | State |
|---|---|---|---|
| 0.5 | Alaska | 79.0 | Georgia |
| 3.4 | Wyoming | 81.1 | Louisiana |
| 4.4 | Nevada | 81.1 | Wisconsin |
| 4.8 | Montana | 81.2 | Kentucky |
| 8.4 | New Mexico | 81.7 | New Hampshire |
| 8.6 | Idaho | 85.7 | South Carolina |
| 8.8 | South Dakota | 95.0 | Tennessee |
| 8.9 | North Dakota | 104.1 | North Carolina |
| 12.9 | Utah | 116.9 | Virginia |
| 15.6 | Arizona | 119.8 | Hawaii |
| 19.4 | Nebraska | 125.5 | Florida |
| 21.3 | Colorado | 127.6 | California |
| 21.7 | Oregon | 143.9 | Indiana |
| 27.5 | Kansas | 156.2 | Michigan |
| 32.1 | Maine | 199.4 | Illinois |
| 37.0 | Arkansas | 260.0 | Ohio |
| 37.2 | Oklahoma | 262.3 | Pennsylvania |
| 42.7 | Texas | 276.5 | Delaware |
| 46.9 | Mississippi | 380.3 | New York |
| 48.0 | Minnesota | 396.6 | Maryland |
| 48.0 | Vermont | 623.7 | Connecticut |
| 50.5 | Iowa | 727.0 | Massachusetts |
| 51.2 | Washington | 905.4 | Rhode Island |
| 67.8 | Missouri | 953.1 | New Jersey |
| 67.9 | Alabama | 12,401.8 | District of Columbia |
| 72.5 | West Virginia | | |

Source: The 1972 Word Almanac and Book of Facts
Newspaper Enterprise Association, Inc., New York.

demand on services to be performed and funded in rural areas by a proportionately smaller working group.

Rural areas experience a dependency ratio some 17 percent higher overall than urban areas as Table 6 indicates. Dependency ratios are calculated by dividing the total number of people aged eighteen to sixty-four into the sum of those under aged eighteen and over aged sixty-five. The derived ratio in concert with poverty status data, employment patterns and per capita income gives a picture of how resources are distributed in rural areas. The dependency ratio reflects dependence based upon an age criteria and does not reflect economic dependency due to unemployment, etc.

Rural Poverty. The United States, for all its wealth, has a population with 13.6 percent of the people living below the "poverty level,"* according to the 1970 census. There are over 27 million poor persons, including individuals, workers, and families with children. The urban population includes 12 percent of its population living below the poverty level. The rural population includes 18.2 percent living below the powerty level, or 9,623,989 people. (8) Thus, almost 10 million people or one in every five persons is poor in rural areas as seen in Table 5. One third of those people earning

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*Poverty status used in this study refers to the Census definition that is based on the commonly used 1964 Social Security definition subsequently modified by a Federal Interagency Committee. This poverty status adjusts for factors such as farm or non-farm residence, family size, number of children under age 18, sex of family head, and changes in the cost of living. For example, in 1969, the average annual family income poverty threshold for a nonfarm family of four headed by a male was 3,745 dollars.

## TABLE 6

## DEPENDENCY RATIOS OF THOSE UNDER 18 AND OVER 65 ON POPULATION 18 TO 65: 1970

| Sector | Numbers (in millions) | Ratio |
|---|---|---|
| U. S. | $\frac{69.7 + 20.1}{113.5}$ | .79 |
| Urban | $\frac{49.7 + 14.6}{84.9}$ | .75 |
| Rural | $\frac{19.8 + 5.4}{28.6}$ | .88 |

Source: Calculated from data from: 1970 Census below poverty level in the U.S. are located in rural areas. However, only one quarter of the total population lives there. A disproportionate number of those living below poverty level are located in rural areas.

Per Capita Income. The profile of per capita income is illuminating. Note in Table 7 that not only is income significantly lower in rural areas but it is even worse for minority group members in rural areas. Table 7 shows that there is over an 800 dollar per person income difference between the average in rural and urban areas. There is over a three fold difference between the median for a Negro farm resident and that of a white urban resident.

The high incidence of poverty runs concurrent with a low incidence of high income earners (over 15,000 dollars per year) in rural areas. Of rural family income earners, only 13 percent earned over 15,000 dollars in 1970 while over 23 percent did so in urban areas. (9) High income earners occur twice as frequently in urban areas as rural and poverty is 50 percent more prevalent in rural areas than urban. Income earning is concentrated in urban areas.

Rural Pockets. Rural America is not a place consistent in apperance, habitation patterns, or population characteristics. The rural population is not evenly dispersed over non-urban areas but is found in uneven configurations due to various combinations of geographic, political, social and economic factors. Rural pockets or regions have developed that have characteristics which are more pronounced in one region than another. Rural pockets exist in Appalachia, Rocky Mountain, Alaska, the South, Pacific and the Plains.

## TABLE 7

## PER CAPITA INCOME AND POVERTY STATUS BY URBAN AND RURAL RESIDENCE AND RACE: 1970

| | Per Capita Income In Dollars | Persons of Poverty In Status 1969 | Percent |
|---|---|---|---|
| United States | | | |
| Total | 3,139 | 27,124,985 | 13.7 |
| White | 3,314 | 18,934,882 | 10.9 |
| Negro | 1,818 | 7,680,105 | 35.0 |
| Spanish | 2,065 | 2,153,834 | 23.5 |
| Urban | | | |
| Total | 3,365 | 17,493,914 | 12.0 |
| White | 3,567 | 11,754,972 | 9.4 |
| Negro | 1,989 | 5,463,921 | 30.6 |
| Spanish | 2,131 | 1,772,998 | 22.0 |
| Rural Non-Farm | | | |
| Total | 2,513 | 8,147,730 | 18.3 |
| White | 2,658 | 5,956,246 | 14.7 |
| Negro | 1,074 | 1,978,154 | 54.9 |
| Spanish | 1,568 | 349,737 | 35.2 |
| Rural Farm | | | |
| Total | 2,415 | 1,566,939 | 18.9 |
| White | 2,510 | 1,286,278 | 16.6 |
| Negro | 888 | 257,309 | 57.7 |
| Spanish | 1,716 | 35,784 | 30.6 |

Source: 1970 Census.

Isolation, a key factor in any discussion of rural areas, is most pronounced in Alaska where 154,000 rural people occupy some 480,000 square miles. (10) Compounding the physical isolation which makes delivery of any services difficult, is very severe weather conditions which inhibit transportation and communication. Indians and Aleuts compose much of the rural population so that cultural heterogeniety combined with little employment opportunity characterize Alaska in addition to isolation and sparse settlement patterns.

The Rocky Mountain area is also characterized by physical isolation. This territory of 850 thousand square miles covers over 28 percent of the contiguous forty-eight states but the total population of the eight states* contained therein is 8.28 million people or only four percent of the U.S. total. There are only 2.2 million people in the rural areas of the Rocky Mountains. (11) In addition to the low population density configuration, there is a high concentration of people of Spanish origin, (13 percent of the population of the region) and Indians, (almost 8 percent) and Blacks (less than one-half of one percent). (12)

The south has the largest rural population in numbers compared to other regions, and the highest percentage of rural people per total area population. Physical isolation is not as important a factor in the South except in the Appalachian region. Per capita income is regionally lowest in the south and there is a comparatively high concentration of Blacks residing in the rural south.

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*Arizona, Colorado, Wyoming, New Mexico, Idaho, Utah, Nevada, Montana.

Blacks compose 7.8 percent of the population of all U.S. rural areas and 7.2 percent of the rural total are located in the south. There is a composition of 17.5 percent Blacks in southern rural areas. The overall U.S. population is composed of 11 percent Blacks but only 0.9 percent for the rural population outside of the South (13). In 1971 no Southern state met the national average of per pupil expenditures. The rural south may be said to be isolated more economically and culturally than physically from the rest of America.

The Plains states area contains highly industrialized cities and rural areas predominantly devoted to farming. The latter activity generates a rural configuration of consistent low density population where most of our nation's one-teacher schools once existed. The Northeast has the highest density of rural population configuration alongside of large industrialized cities.

The Pacific states are similar to the Rocky Mountain states with rural areas often isolated by mountains. The Pacific states differ, however, because of a coastal frontage and the large metropolitan areas along the coast. Orientals and Spanish heritage people occupy a larger percentage of the population in the Pacific. Hawaii, completely isolated by water is also characterized by a large Oriental population and the third smallest rural population in the U.S.

Culturally Diverse Groups. In addition to these geographic areas that isolate their members from urban benefits, there are culturally diverse groups in rural areas. Some culturally diverse groups found in rural America include Blacks, Spanish heritage people, Indians, and migratory farm workers. There are groups distinguishable by reason of culture, race or employment.

Chapters III and IV will deal with the characteristics of Indians and migratory farm workers, and will not be discussed here. It should be noted that migratory farm workers are composed in large part from members of Spanish heritage and Black minority groups. This chapter concentrates on the general niches these minority groups occupy.

Rural Blacks. There were 22,580,289 Blacks in the United States as of 1970, and 4,211,394 Blacks living in rural areas or 18.6 percent of the total Black population. The rural Black population is not equally dispersed throughout the U.S. as 92.7 percent of rural Blacks reside in the South. (14)

Some rural Blacks are part of the migrating mobile group of farmworkers, and many others work as farm laborers. Median school attainment for rural Blacks hovers at the eighth grade level with about 15 percent completing high school. The median age of Black rural residents is 20 compared to 28.1 for the entire U.S. population. (15) Rural Blacks thus experience a very high dependency ratio.

Table 8 shows some basic population figures about Blacks. Of the entire rural population Blacks compose only 7.5 percent of the total. Blacks are thus more of a minority in rural areas than urban areas where they compose 12.2 percent of the population. They are, however, concentrated in the south where they compose 17.5 percent of the rural population.

## TABLE 8

## SYNOPSIS OF BLACK POPULATION IN U.S.: 1970

| | |
|---|---|
| Total Black Population in U.S. | 22,580,289 |
| Total Black Urban Population | 18,368,895 |
| Total Black Rural Population | 4,211,394 |
| Total Black Rural Population Below Poverty Level | 2,202,239 |

Source: 1970 Census.

While 27.5 percent of the white U.S. population lives in a rural area only 18.6 percent of the Black population does so. In 1970, 54.3 percent of the Black rural population earned below the poverty level, while they represent only 22.8 percent of the total rural population which earns below the poverty level. This leaves 7,421,720 people earning below the poverty level in rural areas who are not Black. (16) Comparatively, 30.3 percent of urban Blacks are considered below the poverty level so that a rural Black runs a higher risk of being poor.

Spanish Origin, Surname or Heritage Population. The "Spanish" population in the United States is composed of some 10 million people from Mexico, Puerto Rico, Cuba and South America and is predominately urban. The 1970 Census gives a total of 9,072,602 for "All persons of Spanish origin" and of these 7,912,652 or 87 percent are living in urban areas. (17) According to a recent article there was an undercount in the 1970 census of this population and the total should be 10.6 million for 1973. (18) Of the total Spanish population in the U.S. 96.4 percent or 8.7 million people spoke the Spanish language according to the Census (19). The arguments for bi-lingual education are particularly strong for the Spanish population in the United States. Since only a small portion of the Spanish population resides in rural areas one must recognize the geographic distribution of Spanish speakers including the urban Spanish segment when considering configurations for bilingual telecommunications utilization.

Spanish Rural Population. The number of rural people of "Spanish heritage" is about one million. The 1970 Census gives

961,459 as the total for rural non-farm and 176,467 as the rural farm total giving a rural total of 1,137,926. The Spanish rural sector thus comprises 2.1 percent of the total U.S. rural population. (20) This total can be broken down into several subgroups by country of origin as found in Table 9. Many of this rural segment are farmworkers, and some of them are migrating farm workers.

Most rural people of Mexican descent live either in the West or the South with 48 percent in the former and 44.8 percent in the latter. Rural Puerto Ricans are most predominantly in the Northeast, with 58.7 percent there. (21)

The rural Spanish population has a very high percentage of people speaking the Spanish language. Most people of Spanish heritage are more conversant in Spanish and are handicapped in school and in employment with English. Table 10 shows the figures for those speaking the Spanish language and it can be seen that less than 10 percent of the rural Spanish population speaks English.

The mean family size of rural Spanish persons was 5.22 for rural non-farm population. Mexican origin mean family size for "rural farm" was somewhat higher at 5.82 persons per family.

Of all rural non-farm Spanish persons in 1970, 35.1 percent were living below the poverty level. The percentage of those of Mexican heritage who were living below the poverty level was higher at 42.8 percent. The per capita income of persons of Spanish heritage was 1568 dollars in rural non-farm areas in 1970 (22). Half of more of the rural non-farm Spanish population may be migratory farm workers and others may be local farm workers.

## TABLE 9

## SPANISH RURAL POPULATION BY ORIGIN

| | |
|---|---|
| TOTAL | 1,137,926 |
| Mexican Origin | 656,135 |
| Puerto Rican Origin | 32,427 |
| Cuban Origin | 8,329 |
| South America and Other Origin | 463,139 |

Source: 1970 Census

### TABLE 10

### SPANISH LANGUAGE SPOKEN BY PEOPLE OF SPANISH HERITAGE, URBAN AND RURAL: 1970

| | Total | Number Speaking Spanish Language | Percent |
|---|---|---|---|
| Total Spanish Heritage in U.S. | 9,294,509 | 8,750,423 | 94.1% |
| Urban | 8,156,583 | 7,700,347 | 94.4 |
| Rural Non-farm | 961,459 | 892,156 | 92.7 |
| Rural Farm | 176,467 | 157,920 | 89.4 |

Source: 1970 Census

The rural Spanish population is small, dispersed and poor. Cultural origin within those classified as Spanish population leads to greater dissimilarity. The high dispersion factor, different cultural orientation, compounded with language problems and poverty has led to a very low attainment rate in education and subsequent low earning level. The median school years completed by rural persons of Spanish origin is 8.9 for males and 9.3 for females. (23) Only 26.2 percent of Spanish rural males completed high school while 28.1 percent of the females did, (24) leaving about three quarters of the adult Spanish rural population without a high school education, with many illiterate and unable to converse in English.

Rural Whites. The largest percentage of the rural population is white. Whites account for 88.8 percent of the rural population in America. (25) Over six million white rural residents live below the poverty level. The majority of poor people in rural areas are white, although there are pockets of poverty of other racial and cultural groupings which may, in that area, be greater.

The rural areas are thus composed of various groups of people in unequal geographic distributions. Table 11 below gives a brief numerical summary of the groups; total populations and the percentages.

## Rural Education

Definition. For the purposes of this study, rural education will be defined generally as any education program taking place in rural areas. The definition would include adult and basic education

## TABLE 11

## RURAL POPULATION CENSUS BY GROUP
## WITH PERCENTAGES: 1970[*]

| Group | Number | % of Rural Population |
|---|---|---|
| All Rural | 53,886,996 | 100 |
| White | 47,837,809 | 88.8[+] |
| Black | 4,211,394 | 7.8 |
| Spanish "Heritage" | 1,137,926 | 2.1 |
| Indian | 423,227 | 0.8 |
| Miscellaneous | 276,640 | 0.5 |

[*] Source: 1970 Census

[+] The total white rural population was 48,975,735 and totals 90.9 percent of the rural population but by census bureau definition included Spanish speaking.

programs, public schools, Federal Indian schools, vocational schools and programs, as well as miscellaneous and summer programs. Concentration of information in this chapter will be on public elementary and secondary education.

The governing structure of rural education is similar to education in general. School boards are elected by citizens that control the local schools. State boards of education set requirements for schools to follow. Federal money channelled through the states along with state and local taxes fund the programs. Teachers are responsible for day to day scheduling of academic material, audio visual material, discipline, and other aspects of the schooling process in American public education.

The differences to be found in rural education may be very significant to the student. Many rural students must travel up to several hours by bus to reach school. Students may live in a setting where no one speaks English or where very few have ever completed high school. Funding for the school may be largely from federal funds, especially in the case of Indians or disadvantaged migrant students.

The education, background and quality of the teachers may not be as good as found elsewhere. The number of teachers and peer aged people, and books in the library may be small comparatively. The academic courses and other activities available to the rural student are often quite limited.

Educational Attainment. According to the 1970 Census half a million rural residents over age twenty-five have never been to school and 2 million have less than five years education and are thus classified as functionally illiterate. Almost 20 percent of the population over age twenty-five have not completed the eigth grade. Over 55 percent of the rural adult population, or 16 million adults did not complete high school. (26) Educational attainment in rural areas is significantly lower than urban areas.

Table 12 shows a breakdown of the education attainment of persons over age twenty-five in 1970 with breakdowns for the urban and rural sectors. When urban persons are compared to rural, it will be noted that 10 percent more of the rural sector is without a high school education than in urban areas.

> "Rural adults and youth are the product of an educational system that has historically short-changed rural people. The extent to which rural people have been denied equality of educational opportunity is evident from both the products of the educational system and the resources that go into the system. On both counts, the quality of rural education ranks low." (27)

Census of Schools, Students, Teachers. There were 58,632,070 people between the ages of three and thirty-four enrolled in school in the United States in 1970. The number of those in school in rural areas was 15,314,129 or 26.1 percent of the total. This number compares favorably with the percentage in school in urban areas. (28) Table 13 contains a listing of total and rural school enrollment by state.

From Table 14 it can be seen that generally the number of secondary schools has remained basically unchanged during forty years while the number of high school students tripled. (29) For rural areas this means that schools have enlarged or consolidated to

### TABLE 12

### EDUCATIONAL ATTAINMENT OF PERSONS 25 OR OVER EXPRESSED IN YEARS OF SCHOOLING COMPLETED FOR URBAN AND RURAL AREAS, U.S.: 1970

| Years Schooling Completed (Cumulative) | U.S. | | URBAN | | RURAL | |
|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % |
| Total | 109,890,962 | 100 | 81,147,679 | 100 | 28,743,283 | 100 |
| None | 1,748,412 | 1.5 | 1,251,144 | 1.5 | 497,268 | 1.7 |
| Less Than 5 | 6,054,526 | 5.5 | 4,035,342 | 4.9 | 2,019,184 | 7.0 |
| Less Than 8 | 17,185,573 | 15.6 | 11,559,413 | 14.2 | 5,626,160 | 19.5 |
| Less Than 12 | 52,564,454 | 47.8 | 36,518,084 | 45.0 | 16,046,330 | 55.8 |

Source: 1970 Census, Subject Report; Educational Attainment, pgs. 30 and 32.

## TABLE 13

## STATE BY STATE CENSUS, RURAL POPULATION, SCHOOL ENROLLMENT (AGE 3-34) AND RURAL SCHOOL ENROLLMENT

| State | Population | Rural Pop. | Total School Enrollment | % of Rural Students From Rural Area | Rural School Enrollment |
|---|---|---|---|---|---|
| Alabama | 3,444,165 | 1,431,592 | 964,100 | 26.5 | 380,000 |
| Alaska | 300,382 | 153,853 | 91,886 | 32.5 | 50,061 |
| Arizona | 1,770,900 | 362,819 | 544,176 | 29.5 | 107,020 |
| Arkansas | 1,923,295 | 960,839 | 502,854 | 25.4 | 243,998 |
| California | 19,957,715 | 1,819,999 | 5,970,477 | 29.5 | 537,858 |
| Colorado | 2,207,259 | 471,177 | 691,406 | 31.4 | 147,919 |
| Connecticut | 3,031,709 | 688,131 | 900,930 | 32.0 | 220,364 |
| Delaware | 548,101 | 152,943 | 165,009 | 26.8 | 40,968 |
| Florida | 6,789,412 | 1,322,372 | 1,776,736 | 26.0 | 344,400 |
| Georgia | 4,589,575 | 1,822,991 | 1,267,479 | 26.6 | 485,685 |
| Hawaii | 768,561 | 130,811 | 235,765 | 30.2 | 39,552 |
| Idaho | 712,567 | 325,467 | 216,336 | 30.5 | 99,376 |
| Illinois | 11,109,935 | 1,887,548 | 3,227,335 | 28.7 | 543,228 |
| Indiana | 5,193,669 | 1,822,659 | 1,520,229 | 28.6 | 521,778 |
| Iowa | 2,824,376 | 1,207,551 | 825,438 | 28.5 | 345,068 |

## TABLE 13 (continued)

## STATE BY STATE CENSUS, RURAL POPULATION, SCHOOL ENROLLMENT (AGE 3-34) AND RURAL SCHOOL ENROLLMENT

| State | Population | Rural Pop. | Total School Enrollment | % of Rural Students From Rural Area | Rural School Enrollment |
|---|---|---|---|---|---|
| Kansas | 2,246,578 | 762,344 | 654,900 | 27.9 | 213,233 |
| Kentucky | 3,218,706 | 1,533,261 | 855,618 | 25.4 | 390,039 |
| Louisiana | 3,640,490 | 1,232,384 | 1,096,476 | 29.7 | 366,282 |
| Maine | 993,663 | 487,556 | 283,060 | 28.1 | 137,023 |
| Maryland | 3,922,399 | 917,501 | 1,168,144 | 29.4 | 270,382 |
| Massachusetts | 5,689,170 | 816,184 | 1,665,083 | 33.4 | 272,606 |
| Michigan | 8,875,083 | 2,319,900 | 2,770,179 | 31.1 | 721,929 |
| Minnesota | 3,804,971 | 1,278,411 | 1,186,313 | 30.8 | 393,974 |
| Mississippi | 2,216,912 | 1,229,600 | 658,602 | 29.5 | 363,481 |
| Missouri | 4,676,501 | 1,399,685 | 1,305,679 | 26.1 | 366,299 |
| Montana | 694,409 | 322,065 | 214,868 | 29.5 | 95,026 |
| Nebraska | 1,482,412 | 569,435 | 443,904 | 28.2 | 160,534 |
| Nevada | 488,738 | 93,517 | 134,811 | 27.6 | 25,801 |
| New Hampshire | 737,681 | 320,990 | 206,567 | 27.7 | 89,024 |
| New Jersey | 7,168,164 | 794,900 | 2,018,760 | 29.0 | 230,612 |

## TABLE 13 (continued)

## STATE BY STATE CENSUS, RURAL POPULATION, SCHOOL ENROLLMENT (AGE 3-34) AND RURAL SCHOOL ENROLLMENT

| State | Population | Rural Pop. | Total School Enrollment | % of Rural Students From Rural Area | Rural School Enrollment |
|---|---|---|---|---|---|
| New Mexico | 1,016,000 | 305,295 | 332,761 | 32.9 | 100,622 |
| New York | 18,236,951 | 2,632,536 | 5,031,991 | 31.1 | 819,558 |
| North Carolina | 5,082,059 | 2,796,538 | 1,381,803 | 26.7 | 747,979 |
| North Dakota | 617,761 | 344,119 | 192,858 | 29.6 | 101,863 |
| Ohio | 10,651,848 | 2,628,673 | 3,123,305 | 29.7 | 781,792 |
| Oklahoma | 2,559,229 | 818,211 | 714,919 | 26.7 | 218,397 |
| Oregon | 2,091,385 | 688,874 | 612,454 | 29.5 | 203,092 |
| Pennsylvania | 11,793,907 | 3,366,527 | 3,257,288 | 27.7 | 934,177 |
| Rhode Island | 948,845 | 123,565 | 260,712 | 27.0 | 33,395 |
| South Carolina | 2,590,516 | 1,358,623 | 736,216 | 28.9 | 392,787 |
| South Dakota | 665,507 | 368,877 | 210,068 | 30.0 | 110,753 |
| Tennessee | 3,923,780 | 1,616,980 | 1,044,375 | 24.7 | 399,074 |
| Texas | 11,195,431 | 2,266,898 | 3,224,222 | 26.5 | 601,451 |
| Utah | 1,059,273 | 205,959 | 383,306 | 34.4 | 70,862 |

## TABLE 13 (continued)

## STATE BY STATE CENSUS, RURAL POPULATION, SCHOOL ENROLLMENT (AGE 3-34) AND RURAL SCHOOL ENROLLMENT

| State | Population | Rural Pop. | Total School Enrollment | % of Rural Students From Rural Area | Rural School Enrollment |
|---|---|---|---|---|---|
| Vermont | 444,330 | 301,458 | 131,982 | 29.6 | 89,233 |
| Virginia | 4,648,494 | 1,717,340 | 1,286,929 | 27.0 | 464,362 |
| Washington | 3,109,159 | 932,672 | 1,018,582 | 30.1 | 281,154 |
| West Virginia | 1,744,237 | 1,064,712 | 453,429 | 25.8 | 274,768 |
| Wisconsin | 4,417,731 | 1,508,280 | 1,365,480 | 30.2 | 455,852 |
| Wyoming | 332,416 | 131,539 | 100,354 | 29.4 | 38,695 |

Source: 1970 Census

## TABLE 14

## NUMBER OF TEACHERS, STUDENTS, SCHOOLS, DISTRICTS AND EXPENDITURES FOR PUBLIC ELEMENTARY AND SECONDARY SCHOOLS 1930 - 1970*

| Category | 1930 | 1940 | 1950 | 1960 | 1970 |
|---|---|---|---|---|---|
| Number of School Districts | 127,531 | 117,103 | 83,718 | 40,520 | 25,352 |
| Number of Public Schools | | | | | |
| Secondary | 23,930 | 25,347 | 24,542 | 25,784 | 25,352 |
| Elementary | 238,306 | 202,612 | 128,225 | 91,853 | 65,800 |
| One Teacher Elementary School | 149,282 | 113,600 | 59,652 | 20,213 | 1,815 |
| Number of Students | | | | | |
| Public Secondary | 4,399,422 | 6,601,444 | 5,724,621 | 8,484,869 | 13,021,710 |
| Public Elementary | 20,555,150 | 18,237,451 | 18,352,603 | 25,679,190 | 29,995,626 |
| Expenditures | | | | | |
| Public Elementary and Secondary Schools (In Dollars) | 1,843,552,000 | 1,941,799,000 | 4,687,274,000 | 12,329,389,000 | 34,217,773,000 |
| Expenditure Per Pupil in ADA (Average Daily Attendance) Public Secondary and Elem. | | | | | |
| (a) In Dollars (Actual) | 108 | 106 | 259 | 472 | 970 |
| (b) Adjusted to 71-72 Purchasing Power | 260 | 312 | 450 | 375 | 816 |

*Source: Digest of Educational Statistics, 1972.

accommodate the increase in student population. The changes in the number of elementary schools are more revealing of changes in rural areas. There were 238 thousand elementary schools in 1930 and 65 thousand in 1970. This decrease over forty years took place while the number of students increased from 23 to 30 million. The largest contributing factor has been the virtual elimination of one teacher elementary schools. Table 14 shows that the number of one teacher elementary schools has decreased from 149 thousand in 1930 to 1800 in 1970, (30) which accounts for 85 percent of the decrease in the number of elementary schools. The consolidation and phase out of small schools has been quite a dramatic change in the rural education configuration. Consolidation comes with the cost of additional student travel, usually by school bus. There are other measures and methods which will be discussed later to bring more educational services to rural students.

Number of Schools. For this study it is valuable to know the number of places where students assemble for the purposes of education. There is a problem in separating data for rural schools because students living in rural areas often attend school in an urban setting and thus data is unavailable separated in this way. (31) Data are kept on the size of schools and data are available on the number of rural students so that the approximate number of schools serving rural students can be determined. Table 15 gives the number of school systems and pupils enrolled by enrollment size. It is known from the census that there are over 13 million rural public school students. Thus, if it is assumed that the smallest schools are rural, we can

## TABLE 15

## NUMBER OF PUBLIC SCHOOL SYSTEMS AND NUMBER OF PUPILS ENROLLED, BY SIZE OF SYSTEM: UNITED STATES: 1966-67

| Enrollment Size* | School Systems | | Pupils Enrolled | |
|---|---|---|---|---|
| | Number | Percent | Number (in thousands) | Percent |
| 1 | 2 | 3 | 4 | 5 |
| Total. . . . . . . | 23,390 | 100.0 | + 43,842 | 100.0 |
| 25,000 or more. . . . . | 170 | .7 | 12,590 | 23.7 |
| 12,000 to 24,999. . . . | 350 | 1.5 | 5,730 | 13.1 |
| 6,000 to 11,999 . . . . | 880 | 3.8 | 7,293 | 16.6 |
| 3,000 to 5,999. . . . . | 1,726 | 7.4 | 7,178 | 16.4 |
| 1,800 to 2,999. . . . . | 1,819 | 7.8 | 4,251 | 9.7 |
| 1,200 to 1,799. . . . . | 1,636 | 7.0 | 2,416 | 5.5 |
| 600 to 1,199. . . . . . | 2,838 | 12.1 | 2,437 | 5.6 |
| 300 to 599. . . . . . . | 2,723 | 11.6 | 1,185 | 2.7 |
| 150 to 299. . . . . . . | 2,091 | 8.9 | 459 | 1.0 |
| 50 to 149 . . . . . . . | 2,230 | 9.5 | 209 | .5 |
| 15 to 49. . . . . . . . | 2,673 | 11.4 | 71 | .2 |
| 1 to 14 . . . . . . . . | 2,386 | 10.4 | 22 | .1 |
| None** . . . . . . . . . | 1,868 | 8.0 | --- | --- |

---

*Based on the number of pupils enrolled in October 1966.

+Includes 992,000 students enrolled at the college level.

**Systems not operating schools.

NOTE. - Because of rounding, details may not add to totals.

Source: Digest of Educational Statistics 1972, U.S. Dept. of H.E.W.

proceed upwards in Table 15 until 3,000 students per school is reached. The total number of students in school systems with less than 3,000 per system is over 11 million, a close correlation to the census figure for rural public school students allowing for the growth in school population in the four years between the Table statistics and the 1970 census. The 170 school systems with enrollment over 25,000 account for 28.7 percent of the students but only 0.7 percent of the school systems. Conversely the 2,386 school systems with 14 pupils or less account for 0.1 percent of the pupils enrolled in public school but 10.2 percent of the school systems. (32) Hence 3126 school systems, assumed urban, had an enrollment of 32.7 million students while 18,396 school systems, assumed rural, had 11.5 million students in 1966-67.

The latest statistics available indicate a further decline in the number of school districts to 17,289 in 1971. Only 16,838 of these districts operate schools. (33) Holding the number of urban districts constant there were about 14 thousand rural districts. A rural district will often consolidate with another or send their students to a nearby, larger school and thus not operate its own school. Table 12 shows that there are an average of 5 schools per district. However, with some rural districts operating no schools while others operate an elementary school plus a high school, an average of two schools per rural district or 28 thousand schools will be assumed. Thus, it is estimated that some 13 million rural public school students attend approximately 28 thousand schools in 14 thousand school districts.

Rural schools almost defy averaging or typifying. They range in size from small one-teacher schools as found in Alaska with 10 or 14 students, to a Navajo school drawing several hundred students from a 1000 square mile area, to a consolidated school in the East with busses bringing over a thousand students to school. Some examples of general averages can be gleaned from The Texas Small Schools Project. (34) Texas has 486 small schools, each with less than 500 students in ADA (Average Daily Attendance). The total ADA for these 486 small schools is 115,525 or about 20 percent of the total rural public school population given by the census for Texas. Of the 119 schools that have become members of the Project they have a combined ADA of 27,897, giving an average of 235 students in ADA per school. These 119 schools have a total of 1945 teachers and administrators giving an average of fourteen students per teacher or administrator. Only seventy-eight of the 1945 teachers and administrators lacked Bachelor's degrees while 673 had Master's degrees.

Although an average can be reached for the typical rural school, it is not completely revealing because rural areas are beset with considerable range in population settlement, school district size and school population. Consolidation is having its impact but there are still many small schools in rural America and they will no doubt continue functioning along with the larger consolidated schools. Lower teacher salaries, bussing and small size are realities in rural areas.

Rural Student Density. Geographic features, transportation links and employment have much to do with where people settle over a given area of land. Without pinpointing where every school is located and how far it is to the next school, it is instructive to develop density figures for rural students per square mile. Within any given area including a town, city, county, state, region, and area there occur varying patterns and densities of habitation and thus school needs. Remembering this, densities will now be generated, by state, for rural public school students. Some interesting patterns develop by regions as seen in Table 16 and Figure 1.

The highest concentrations of rural public school students occur in the Northeast. The South and parts of the Midwest have the next lowest density averages and the West, far West, Alaska and Pacific have the lowest. Urban areas, comparitively, have up to several thousand students per square miles. To gain a perspective on the implications of these numbers it helps to calculate how many square miles of averagely populated rural area would be needed to obtain, say, 100 students. In New Mexico it would require 750 square miles, in Alaska 1428, in Arkansas twenty-two and New Hampshire five square miles. Keep in mind that in a 1000 square mile area it may only be twenty miles from the center to the furthest point. Rural school districts average about 200 square miles per district. (35)

Expenditures for Education. Table 17 shows the relationship between the total expenditures in education and the gross national product (GNP). Except during the Depression, expenditures have risen steadily in relation to the GNP year by year. The GNP has had spurts and jumps that have led to changes in the percentage of educational expenditure. The overall trend is one where the

## TABLE 16

## PUBLIC SCHOOL DENSITY FOR THE RURAL POPULATION BY STATE: 1970

| State | Area (sq. miles) | Rural Public School Population K → 12 | Public School Student Density/Sq. Mile |
|---|---|---|---|
| Alabama | 50,708 | 354,279 | 6.98 |
| Alaska | 586,400 | 45,506 | .077 |
| Arizona | 113,417 | 94,292 | .83 |
| Arkansas | 51,945 | 229,322 | 4.41 |
| California | 156,361 | 462,136 | 2.95 |
| Colorado | 103,766 | 132,429 | 1.27 |
| Connecticut | 4,862 | 180,811 | 37.18 |
| Delaware | 1,982 | 38,008 | 19.17 |
| Florida | 54,090 | 304,324 | 5,62 |
| Georgia | 58,073 | 447,713 | 7.70 |
| Hawaii | 6,424 | 34,350 | 5.34 |
| Idaho | 82,677 | 91,869 | 1.11 |
| Illinois | 55,748 | 470,587 | 8.44 |
| Indiana | 36,097 | 464,397 | 12.86 |
| Iowa | 55,941 | 304,941 | 5.45 |
| Kansas | 81,787 | 186,901 | 2.28 |
| Kentucky | 39,650 | 359,517 | 9.06 |
| Louisiana | 44,930 | 323,707 | 7.20 |
| Maine | 30,920 | 127,196 | 4.11 |
| Maryland | 9,891 | 225,267 | 22.77 |
| Massachusetts | 7,826 | 220,904 | 28.22 |
| Michigan | 56,817 | 631,429 | 11.11 |
| Minnesota | 79,289 | 347,281 | 4.37 |
| Mississippi | 47,296 | 323,934 | 6.84 |
| Missouri | 68,995 | 327,138 | 4.74 |

## TABLE 16 (continued)

## PUBLIC SCHOOL DENSITY FOR THE RURAL POPULATION BY STATE: 1970

| State | Area (sq. miles) | Rural Public School Population K → 12 | Public School Student Density/Sq. Mile |
|---|---|---|---|
| Montana | 145,587 | 186,901 | .59 |
| Nebraska | 76,483 | 140,027 | 1.83 |
| Nevada | 109,889 | 24,103 | .21 |
| New Hampshire | 9,027 | 188,555 | 20.88 |
| New Jersey | 7,521 | 193,701 | 25.75 |
| New Mexico | 121,412 | 91,435 | .75 |
| New York | 47,831 | 693,555 | 14.50 |
| North Carolina | 48,718 | 685,374 | 14.04 |
| North Dakota | 69,273 | 94,122 | 1.35 |
| Ohio | 40,975 | 699,121 | 17.06 |
| Oklahoma | 68,782 | 204,069 | 2.96 |
| Oregon | 96,184 | 181,368 | 1.88 |
| Pennsylvania | 44,966 | 817,307 | 18.17 |
| Rhode Island | 1,049 | 26,150 | 24.92 |
| South Carolina | 30,225 | 363,025 | 12.01 |
| South Dakota | 77,047 | 101,405 | 1.31 |
| Tennessee | 41,328 | 370,564 | 8.96 |
| Texas | 262,134 | 553,306 | 2.11 |
| Utah | 82,906 | 64,301 | .77 |
| Vermont | 9,267 | 72,784 | 7.85 |
| Virginia | 39,730 | 412,519 | 10.37 |
| Washington | 66,570 | 254,498 | 3.82 |
| West Virginia | 24,070 | 255,189 | 10.60 |
| Wisconsin | 54,464 | 385,600 | 7.07 |
| Wyoming | 97,203 | 36,186 | .37 |

## TABLE 16 (continued)

## PUBLIC SCHOOL DENSITY FOR THE RURAL POPULATION BY STATE: 1970

| State | Area (sq. mile) | Rural Public School Population K → 12 | Public School Student Density/Sq. Mile |
|---|---|---|---|
| U.S.A. | 3,615,122 | 13,609,862 | 3.76 (avg.) |
| U.S.A. excluding Alaska and Hawaii | 3,022,261 | 13,530,006 | 4.47 (avg.) |

Source: Derived from 1970 Census

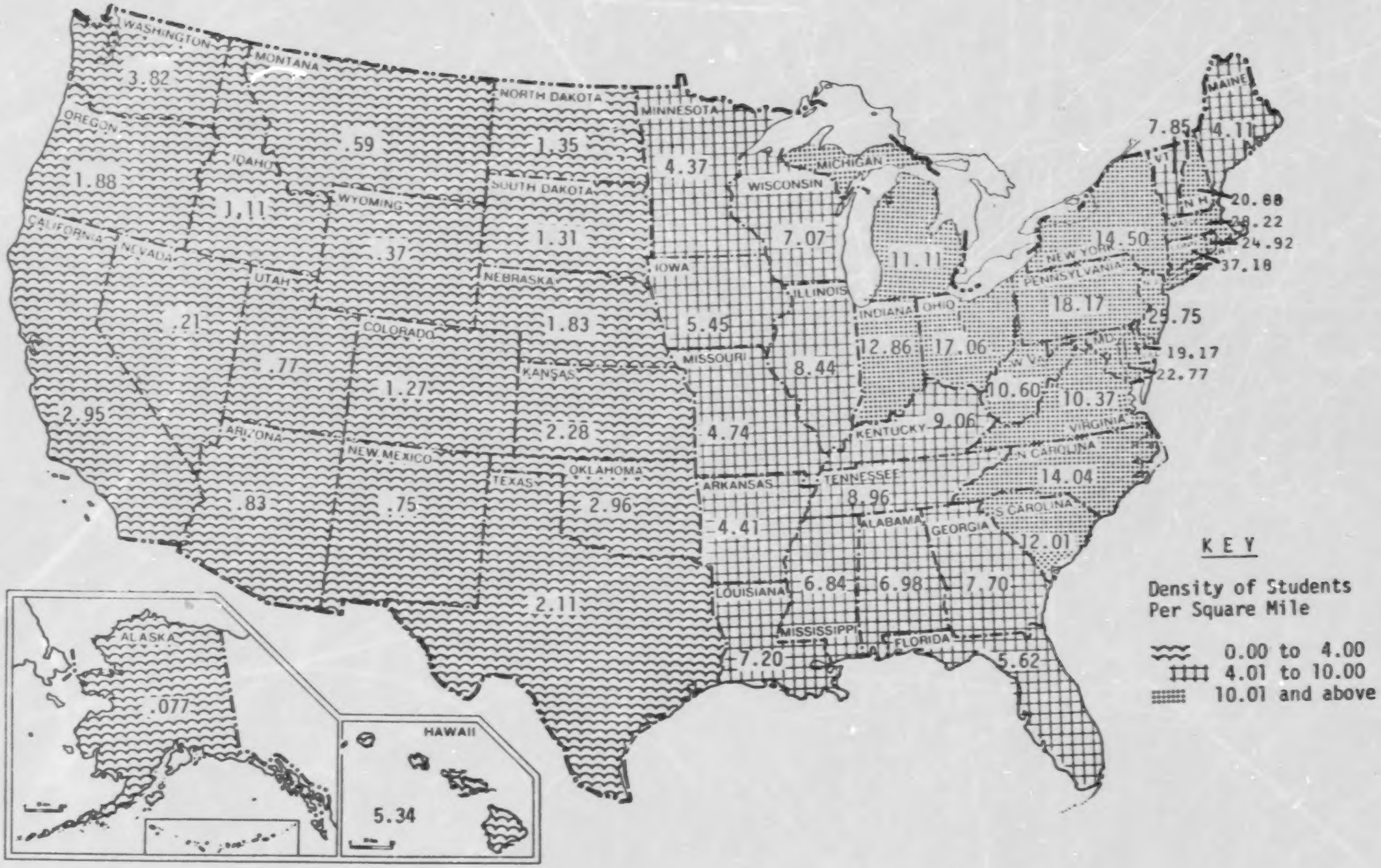
WASHINGTON
3.82
OREGON
1.88
CALIFORNIA
2.95
NEVADA
.21
IDAHO
1.11
MONTANA
.59
WYOMING
.37
UTAH
.77
ARIZONA
.83
COLORADO
1.27
NEW MEXICO
.75
NORTH DAKOTA
1.35
SOUTH DAKOTA
1.31
NEBRASKA
1.83
KANSAS
2.28
OKLAHOMA
2.96
TEXAS
2.11
MINNESOTA
4.37
IOWA
5.45
MISSOURI
4.74
ARKANSAS
4.41
LOUISIANA
7.20
WISCONSIN
7.07
ILLINOIS
8.44
MICHIGAN
11.11
INDIANA
12.86
OHIO
17.06
KENTUCKY
9.06
TENNESSEE
8.96
MISSISSIPPI
6.84
ALABAMA
6.98
GEORGIA
7.70
FLORIDA
5.62
S CAROLINA
12.01
N CAROLINA
14.04
VIRGINIA
10.37
W VA
10.60
MD
PENNSYLVANIA
18.17
NEW YORK
14.50
VT
7.85
MAINE
4.11
N H
20.88
28.22
24.92
37.18
25.75
19.17
22.77
ALASKA
.077
HAWAII
5.34
K E Y
Density of Students
Per Square Mile
0.00 to 4.00
4.01 to 10.00
10.01 and above

Figure 1: DENSITY OF RURAL PUBLIC SCHOOL STUDENTS PER SQUARE MILE, BY STATE WITH DENSITY GROUPINGS, 1970

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Source: 1970 Census

# TABLE 17

# GROSS NATIONAL PRODUCT (GNP), EXPENDITURES FOR EDUCATION,* AND EXPENDITURES AS A PERCENT OF GNP 1930 TO 1970+

| Year | GNP (in millions) | Expenditures For Education | Expenditures For Education as a Percent of the GNP |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 1930 | 103,095 | 3,233,601 | 3.1 |
| 1940 | 90,494 | 3,199,593 | 3.5 |
| 1950 | 256,484 | 8,795,635 | 3.4 |
| 1960 | 483,650 | 24,722,464 | 5.1 |
| 1970 | 930,284 | 70,000,000 | 7.5 |

*Includes expenditures for all schools, at all levels of education - not just public elementary and secondary education.

+Source: Digest of Educational Statistics 1972. U.S. Dept. of H.E.W.

percentage of the GNP spent on education has increased by a factor of about 2.5 over a 40 year span from 3.1 percent to 7.5 percent.

Projections for public school average daily attendance in 1982 show figures that indicate a drop of a few hundred thousand students from 1972 figures. The total expenditure for public school is projected to go from 40.1 billion in 1972 to 54.9 billion in 1982 (expressed in 1972 dollars) or a rise from 934 dollars per year per pupil in average daily attendance in 1972 to 1303 dollars per year in 1982 (expressed in 1972 dollars). (36) Costs are thus expected to continue to increase both actually and in relation to the total GNP expenditures.

The costs have increased consistently for the annual schooling of a pupil per year. There is much concern, both casual and professional, as to whether there has been substantial gain in quality of education to warrant a 250 percent increase in education's share of the GNP over forty years as seen in Table 14. Average cost per student are now about 1000 dollars per year as seen in Table 18. Concern has also been raised as to the limit of the percentage of increase. Due to the nature of the present system interest is directed towards new building construction, cost of new buildings, teachers salaries and teacher contracts. Attention by the public is not focused as heavily on output per monetary unit, although concern among government administrators and school officials is developing in this direction.

A strong factor influencing the expenditures per pupil that becomes critical in rural areas is the correlation between per capita income and the expenditures per pupil. In Table 18 it can be

## TABLE 18

## TOTAL PERSONAL INCOME, PER CAPITA INCOME AND EXPENDITURE PER PUPIL IN PUBLIC ELEMENTARY AND SECONDARY DAY SCHOOLS BY STATES: 1971*

| State | Personal income | | Expenditure per pupil |
|---|---|---|---|
| | Total (in millions) | Per capita | Total |
| 1 | 2 | 3 | 4 |
| United States . . . . | $357,085 | $4,156 | $1,091 |
| Alabama . . . . . . . . . . | 10,765 | 3,037 | 629 |
| Alaska. . . . . . . . . . . | 1,525 | 4,875 | 1,896 |
| Arizona . . . . . . . . . . | 7,287 | 3,913 | 1,003 |
| Arkansas. . . . . . . . . . | 6,005 | 3,078 | 688 |
| California. . . . . . . . . | 94,118 | 4,640 | 1,049 |
| Colorado. . . . . . . . . . | 9,457 | 4,153 | 1,061 |
| Connecticut . . . . . . . | 15,322 | 4,995 | 1,248 |
| Delaware. . . . . . . . . . | 2,610 | 4,673 | 1,511 |
| Florida . . . . . . . . . . | 27,611 | 3,930 | 1,029 |
| Georgia . . . . . . . . . . | 16,786 | 3,599 | 887 |
| Hawaii. . . . . . . . . . . | 3,694 | 4,738 | 1,197 |
| Idaho . . . . . . . . . . . | 2,511 | 3,409 | 835 |
| Illinois. . . . . . . . . . | 53,400 | 4,775 | 1,181 |
| Indiana . . . . . . . . . . | 21,120 | 4,027 | 1,108 |
| Iowa. . . . . . . . . . . . | 11,088 | 3,877 | 1,157 |
| Kansas. . . . . . . . . . . | 9,460 | 4,192 | 1,025 |
| Kentucky. . . . . . . . . . | 10,830 | 3,306 | 722 |
| Louisiana . . . . . . . . . | 12,010 | 3,252 | 969 |
| Maine . . . . . . . . . . . | 3,416 | 3,375 | 899 |
| Maryland. . . . . . . . . . | 18,119 | 4,522 | 1,252 |
| Massachusetts . . . . . . | 26,285 | 4,562 | 1,153 |
| Michigan. . . . . . . . . . | 39,850 | 4,430 | 1,410 |
| Minnesota . . . . . . . . . | 15,564 | 4,032 | 1,271 |
| Mississippi . . . . . . . | 6,273 | 2,788 | 706 |
| Missouri. . . . . . . . . . | 18,537 | 3,940 | 955 |
| Montana . . . . . . . . . . | 2,575 | 3,629 | --- |
| Nebraska. . . . . . . . . . | 6,077 | 4,030 | 990 |
| Nevada. . . . . . . . . . . | 2,460 | 4,822 | 1,113 |
| New Hampshire . . . . . . | 2,877 | 3,796 | 978 |

## TABLE 18 (continued)

## TOTAL PERSONAL INCOME, PER CAPITA INCOME AND EXPENDITURE PER PUPIL IN PUBLIC ELEMENTARY AND SECONDARY DAY SCHOOLS BY STATES: 1971*

| State | Personal income | | Expenditure per pupil |
|---|---|---|---|
| | Total (in millions) | Per capita | Total |
| 1 | 2 | 3 | 4 |
| New Jersey | 35,146 | 4,811 | 1,399 |
| New Mexico | 3,448 | 3,298 | 961 |
| New York | 91,742 | 5,000 | 1,669 |
| North Carolina | 17,661 | 3,424 | 773 |
| North Dakota | 2,222 | 3,538 | 824 |
| Ohio | 44,833 | 4,175 | 989 |
| Oklahoma | 9,140 | 3,515 | 757 |
| Oregon | 8,470 | 3,959 | 1,129 |
| Pennsylvania | 49,349 | 4,147 | 1,382 |
| Rhode Island | 3,957 | 4,126 | 1,151 |
| South Carolina | 8,274 | 3,142 | 806 |
| South Dakota | 2,321 | 3,441 | 891 |
| Tennessee | 13,183 | 3,300 | 744 |
| Texas | 42,582 | 3,726 | 775 |
| Utah | 3,768 | 3,442 | 828 |
| Vermont | 1,650 | 3,638 | 1,418 |
| Virginia | 18,400 | 3,899 | 1,052 |
| Washington | 14,221 | 4,132 | 1,009 |
| West Virginia | 5,789 | 3,275 | 794 |
| Wyoming | 1,331 | 3,929 | 1,142 |

*Source: Digest of Educational Statistics 1972, H.E.W.

seen that in the state by state analysis there is a parallel higher per pupil expenditure as personal income rises. The lowest expenditures per pupil occur in the states with the lowest per capita income. Rural students living in a low income area, minority group or not, are thus victims of discrimination by location.

That rural areas bear the burden of extracting funds where there is relatively less money can be seen by the following two points analyzed from Table 18. The first factor is that of the ten states with the highest percentage of rural population eight of them have an average per pupil expenditure of less than one thousand dollars. The other factor is that the south, which has the highest percentage and number of rural residents of all regions accounts for ten of the twenty-one states whose average expenditures are below one thousand dollars per student. Comparing Table 18 with Figure 1 it can be seen that a high population density does not necessarily lead to a high per capita income or per student expenditure.

Rural expenditures per student. There is considerable debate over the optimum number of students that rural schools should try to reach through such measures as consolidation. Putting aside qualitative and curriculum questions for a moment the economic costs of various school sizes for rural areas will be considered. The following tables come from a study in California which may not be representative of all areas but serves as an example.

It can be seen in Table 19 that below an enrollment of 250 students in elementary schools and below 200 in high schools, there is generally a cost burden for rural areas. The other cost item which

## TABLE 19

## AVERAGE COST PER PUPIL ACCORDING TO SCHOOL POPULATION 1970

### Elementary School Districts

| Pupil Population | Avg. Cost Per Pupil |
|---|---|
| 5 - 99 | 398 |
| 100 - 249 | 351 |
| 250 - 499 | 319 |
| 500 - 999 | 308 |
| 1,000 - 4,999 | 320 |
| 5,000 - up | 329 |

### High School Districts

| | |
|---|---|
| 5 - 99 | 992 |
| 100 - 199 | 712 |
| 200 - 399 | 556 |
| 400 - 599 | 598 |
| 600 - 999 | 514 |
| 1,000 - 4,999 | 501 |
| 5,000 - up | 481 |

Source: (39)

presents not only logistical and administrative problems as well as economic is busing for rural students. These two factors were pointed out by the Rural Education Association:

> "... in most operating educational programs, two cost over-burdens are usually associated with rural areas and areas of sparse population: (1) additional costs due to distance pupils must be transported, and, (2) additional costs associated with small administrative units. These costs are referred to as "equal service overburdens." (38)

A report from Alaska on small schools sums up the impact on rural areas which have inadequate funds for education expenditure as follows:

> "This differential in fiscal ability to support educational programs is reflected in less than adequate facilities and instructional materials, a disproportionate number of unqualified teachers, a high rate of teacher turnover, fewer and less effective special services, and ultimately a higher dropout rate and inadequately prepared graduates." (40)

Characteristics of Disadvantaged Rural Students. Succeeding chapters will describe more carefully the Indian and migrant student's characteristics, but at this point a general view of the characteristics of disadvantaged students is warranted. The summary below is from a report to the U.S. Senate by the director of the ERIC Clearinghouse on Rural Education and Small Schools and draws upon the most significant findings of current reports on the subject and gives a brief view of factors pervasive in rural education. (41)

> "A review of the available research relevant to the characteristics of disadvantaged rural students shows them to be affected in seven general areas. The low socio-economic status of large numbers of noncorporate-farm rural families is a characteristic of prime importance, particularly in view of the relationship between economic status and school achievement for rural as well as urban children. In addition, the educational and occupational

> aspirations of rural students appear to be negatively affected by their low economic status and possibly further depressed by factors related to geographic isolation. Many rural young people who will not be able to make a satisfactory living by farming do not aspire to any higher skilled urban occupations nor to the educational level which would prepare them for such work. Possibly related to socioeconomic status are other attitudes found among rural children which may further hinder their progress: low self-esteem feelings of helplessness in the face of semingly unconquerable environmental handicaps, and improverished confidence in the value and importance of education as an answer to their problems. All of those attitudes understandably may contribute to the child's failure to benefit from his schooling."

These seven characteristics relate to complex intertwining systems that operate in rural America. Clearly a student in rural areas, especially if he is disadvantaged, has educational needs greater, not lesser than, the mainstream American student.. Many of these needs transcend the traditional curriculum and perhaps the present system.

## Summary

Rural America is composed of 53.8 million people living in various density configurations in every state. White people predominate the rural population with Blacks, Spanish and Indians in smaller numbers. The per capita income is lower in rural areas than urban and with a high frequency of poverty, especially for minority groups. One third of the country's poor live in rural areas. The age structure is such that the dependency ratio is higher than in the urban sector. Educational attainment in rural areas is lower than the urban sector, with a higher illiteracy rate, higher drop out rate and lower rate of completion for high school and college.

In general the situation in public schools in the U.S. including rural schools in recent years has been that the number of students, the number of teachers, the amount of information to be transferred and the costs per student have all increased. The number of schools and school districts has decreased, and the student/teacher ratio has decreased slightly. The average attainment level of formal schooling has increased in the U.S. The future indicates a slight decrease in the number of public school students throughout the U.S. due to changes in the population structure. Whether this will also be true for rural areas remains to be determined.

Rural schools suffer from all the problems mentioned above with the addition of isolation, a lower tax base and smaller information base for students to draw from. Rural schools also suffer the cost overburdens of busing, and small units of operation. Teacher salaries are subsequently not as attractive and the quality of the teachers and thus the education leaves much to be desired.

Rural schools districts numbering about 14,000 account for some 13.6 million rural school students. The geographic isolation gives densities of rural students below one per square mile in some places in the West to over twenty in the East. Schools districts average 200 square miles apiece in rural areas. Rural students do not gain the exposure to large libraries, large numbers of course options, and the other life experiences including exposure to more people and ideas that occur in the urban areas.

Despite the continued trend for consolidation to bring more benefits to rural students through the benefits of larger schools there is still a system that unequally educates, especially in the rural areas. Problems that stem from poverty, isolation, social environment, problems of culturally diverse groups, lack of resources, and quality of teaching staff have not been combated with consolidation. Bilingual techniques have not been widely adopted to teach students who speak another language on entering schools. Migrating farm workers who move from school to school and those who come from more depressed economic areas still do not receive median levels of education. Or in the words of the Task Force on Rural Education,

> "Most of the deficiencies in rural education stem from a combination of problems associated with personal poverty, community isolation, limited public services, lack of leadership, and the concomitant of these factors - insufficient taxable resources to support educational services and programs which are available in other parts of the country." (42)

# FOOTNOTES

Chapter II

1. U. S. Department of Commerce, Bureau of the Census, 1970 Census of Population, Subject Report PC(2)-D1: Detailed Characteristics, (Washington, D.C.: Government Printing Office).

2. Ibid.

3. Ibid.

4. Peter C. Goldmark, The New Rural Society, 1973 University Lecture Series, Cornell University.

5. 1970 Census, op. cit., PC(2)-C1: General Social and Economic Characteristics.

6. Ibid.

7. Ibid.

8. Ibid., PC(2)-94: Low Income Population and PC(2)-C1: General Social and Economic Characteristics.

9. Ibid.

10. 1970 Census, op. cit., Subject Report PC(2)-C1: General Social and Economic Characteristics.

11. Ibid.

12. Ibid.

13. Ibid.

14. Ibid.

15. Ibid.

16. Ibid.

17. 1970 Census, op. cit, Subject Report PC(2)-1D: Persons of Spanish Surname.

18. "Census Bureau Unveils Revised Count on U.S. Spanish Speaking," AGENDA, National Council of La Raza, Vol. IV, No. 3, (March, 1974).

19. *1970 Census*, op. cit.

20. Ibid.

21. Ibid.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid.

26. Ibid.

27. The President's National Advisory Commission on Rural Poverty, *The People Left Behind* (Washington, D.C.: Government Printing Office, 1967) p. 41.

28. *1970 Census*, op. cit., Subject Report PC(2)-C1: General Social and Economic Characteristics.

29. U.S., Department of Health, Education and Welfare, Office of Education, *Digest of Educational Statistics, 1972 Edition* (Washington, D.C.: Government Printing Office, 1973).

30. Ibid.

31. M.C.S. Noble, Jr. and Howard A. Dawson, *Handbook on Rural Education* (Washington, D.C.: National Education Association, 1961).

32. *Digest of Educational Statistics*, op. cit.

33. Ibid.

34. Texas Education Agency, *Texas Small Schools Project 1969* (Austin, Texas: Texas Education Agency, March, 1970) ED-056-787.

35. Divide total U.S. Land area by 14,000 rural school districts to obtain 200.

36. U.S., Department of H.E.W., Office of Education, *Projection of Educational Statistics to 1981-1982* (Washington, D.C.: Government Printing Office, 1973).

37. Neal E. Rosenberg, "School Sizes as a Factor of School Expenditure," *Journal of Secondary Education*, 45:135-142, (March, 1970), quoted in William H. Clements, *Ideal High School Size: A Mirage in the Desert*, Div. of Institutional Research and Studies, (Wisconsin State University, 1970) ED-056-689.

38. Lewis R. Tamblyn, Rural Education in the United States (Washington, D.C.: Rural Education Association, 1971).

39. Rosenberg, op. cit.

40. Alaska State Department of Education, The Big Picture on Small Schools (Juneau, Alaska, July 1972) ED-068-252

41. Everett D. Edington, "A Summary of Research in Rural Education." Testimony to the U.S. Senate Select Committee on Equal Educational Opportunity, (Las Cruces, New Mexico: ERIC, Clearinghouse on Rural Education and Small Schools, September 1971) ED-053-842.

42. Task Force on Rural Education, Report of Task Force on Rural Education, U.S. Office of Education. (DHEW), (Washington, D.C.: Government Printing Office, 1969) ED-051-921.

# CHAPTER III

## AMERICAN INDIANS, INDIAN EDUCATION, AND INDIAN TELECOMMUNICATIONS PROJECTS

> "We know that you highly esteem the kind of learning taught in those Colleges, and that the Maintenance of our young Men, while with you, would be very expensive to you. We are convinced, that you mean to do us Good by your Proposal; and we thank you heartily. But you, who are wise must know that different Nations have different Conceptions of things and you will therefore not take it amiss, if our Ideas of this kind of Education happen not to be the same as yours. We had some Experience of it. Several of our young People were formerly brought up at the Colleges of the Northern Provinces: they were instructed in all your Sciences; but, when they came back to us, they were bad runners, ignorant of every means of living in the woods ... neither fit for Hunters, Warriors, nor Counsellors, they were totally good for nothing.
>
> We are, however, not the less oblig'd by your kind Offer, tho' we decline accepting it; and to show our grateful Sense of it, if the Gentlemen of Virginia will send us a Dozen of their Sons, we will take Care of their Education, instruct them in all we know, and make Men of them."
>
> Response from the Six Nations at Lancaster, Pennsylvania to offers to send boys to William and Mary College, June, 1744. (1)

### Introduction

This chapter will first examine general census and demographic characteristics of American Indians followed by a brief history as it relates to the special legal status and education of Indians. This will be followed by some analysis of general and educational issues and needs concerning Indians. Finally a section will be devoted to reviewing Indian telecommunications projects.

## Indian Census, Demographics, Tribes and Languages

Census. The total Indian population as reported in the 1970 Census was 794,730. (2) This total includes urban and rural Indians as well as those that live on reservations. American Indians live in every state with the fewest in Vermont. (See Table 20). Three states have over 90 thousand Indian inhabitants: Oklahoma, Arizona and California. By region, the west contains about half of the Indian population in the United States, with 5 percent in the northwest and the remainder about equally divided between the central and southern regions.

The Indian population increased sizeably between 1960 and 1970, which can be seen in Table 20. The increase of over 250 thousand, about a 50 percent increase in a decade is the result of a 3.3. percent growth rate. At the same rate of growth there will be over one million Indians by the end of the present decade.

With such a rapid population expansion there is a median age of 20.4. With such a youthful population there are 213,245 Indians of school age (between 5-18 years old).

Indians are defined here as being one-quarter or more Indian "blood," or defining oneself as Indian by virtue of cultural background, or regarded as Indian by the community. The Census Bureau counts anyone who is one-quarter Indian "blood" as being an Indian; if a person is in question then the consideration of location is used, where if one is treated as an Indian by the community then he is counted in the Census as Indian. The criteria of "blood" is a racial consideration and the treatment by the community is a cultural consideration. One is therefore constantly dealing with different definitions of Indian because statistics are based on racial, cultural and situational information. What is of concern for this study are those who are treated as Indians, those who consider themselves Indians and may, therefore, have educational needs not met by the traditional system.

Tribes. The Census indicates that there are over 146 tribal groups while the Bureau of Indian Affairs (BIA) considers there to be about 140 tribes. The Indian population is not evenly distributed among tribes. Table 21 indicates the distribution of Indians among tribes. It can be seen that four, the Navajo, Cherokee, Sioux, and Chippewa Tribes account for one third of all Indians. The above four Tribes plus a group of twelve large Tribes account for half of all Indians. The remaining Indian population belong to 130 tribes.

Figure 2 illustrates the geographic distribution of tribes in the United States. Figure 2 in conjunction with Tables 20 and 21 give a sense of where the largest concentration of Indians live, namely the west especially Arizona, South Dakota, Oklahoma, California, Washington, and New Mexico. Clearly Indians are dispersed over a large area with clusters of concentrated habitation.

All Indian tribes are not alike. If the Native Americans alive on this continent had not been mistakenly taken for the people inhabiting the supposed continent of India, it is wondered whether the various tribes and groups would have ever been categorized together as they are so often. Perhaps because Indian cultures on this continent predate European contact they have a similarity, but

## TABLE 20

## INDIAN POPULATION BY STATES: 1970 and 1960

| | 1970 | 1960 |
|---|---|---|
| UNITED STATES | 792,730 | 523,591 |
| Alabama | 2,443 | 1,276 |
| Alaska | 16,276 | 14,444 |
| Arizona | 95,812 | 83,387 |
| Arkansas | 2,014 | 580 |
| California | 91,018 | 39,014 |
| Colorado | 8,836 | 4,288 |
| Connecticut | 2,222 | 923 |
| Delaware | 656 | 597 |
| District of Columbia | 956 | 587 |
| Florida | 6,677 | 2,504 |
| Georgia | 2,347 | 749 |
| Hawaii | 1,126 | 472 |
| Idaho | 6,687 | 5,231 |
| Illinois | 11,413 | 4,704 |
| Indiana | 3,887 | 948 |
| Iowa | 2,992 | 1,708 |
| Kansas | 8,672 | 5,069 |
| Kentucky | 1,531 | 391 |
| Louisiana | 5,294 | 3,587 |
| Maine | 2,195 | 1,879 |
| Maryland | 4,239 | 1,538 |
| Massachusetts | 4,475 | 2,118 |
| Michigan | 16,854 | 9,701 |
| Minnesota | 23,128 | 15,496 |
| Mississippi | 4,113 | 3,119 |
| Missouri | 5,405 | 1,723 |
| Montana | 27,130 | 21,181 |
| Nebraska | 6,624 | 5,545 |
| Nevada | 7,933 | 6,681 |

TABLE 20 (continued)

## INDIAN POPULATION BY STATES: 1970 and 1960

| | 1970 | 1960 |
|---|---|---|
| New Hampshire | 361 | 135 |
| New Jersey | 4.706 | 1,699 |
| New Mexico | 72,788 | 56,255 |
| New York | 28.355 | 16,491 |
| North Carolina | 44,406 | 38,129 |
| North Dakota | 14,369 | 11,736 |
| Ohio | 6,654 | 1,910 |
| Oklahoma | 98.468 | 64,689 |
| Oregon | 13,510 | 8,026 |
| Pennsylvania | 5,533 | 2,122 |
| Rhode Island | 1,390 | 932 |
| South Carolina | 2,241 | 1,098 |
| South Dakota | 32,365 | 25,794 |
| Tennessee | 2,276 | 638 |
| Texas | 17,957 | 5,750 |
| Utah | 11,273 | 6,961 |
| Vermont | 229 | 57 |
| Virginia | 4,853 | 2,155 |
| Washington | 33.386 | 21,076 |
| West Virginia | 751 | 181 |
| Wisconsin | 18,924 | 14,297 |
| Wyoming | 4,980 | 4,020 |

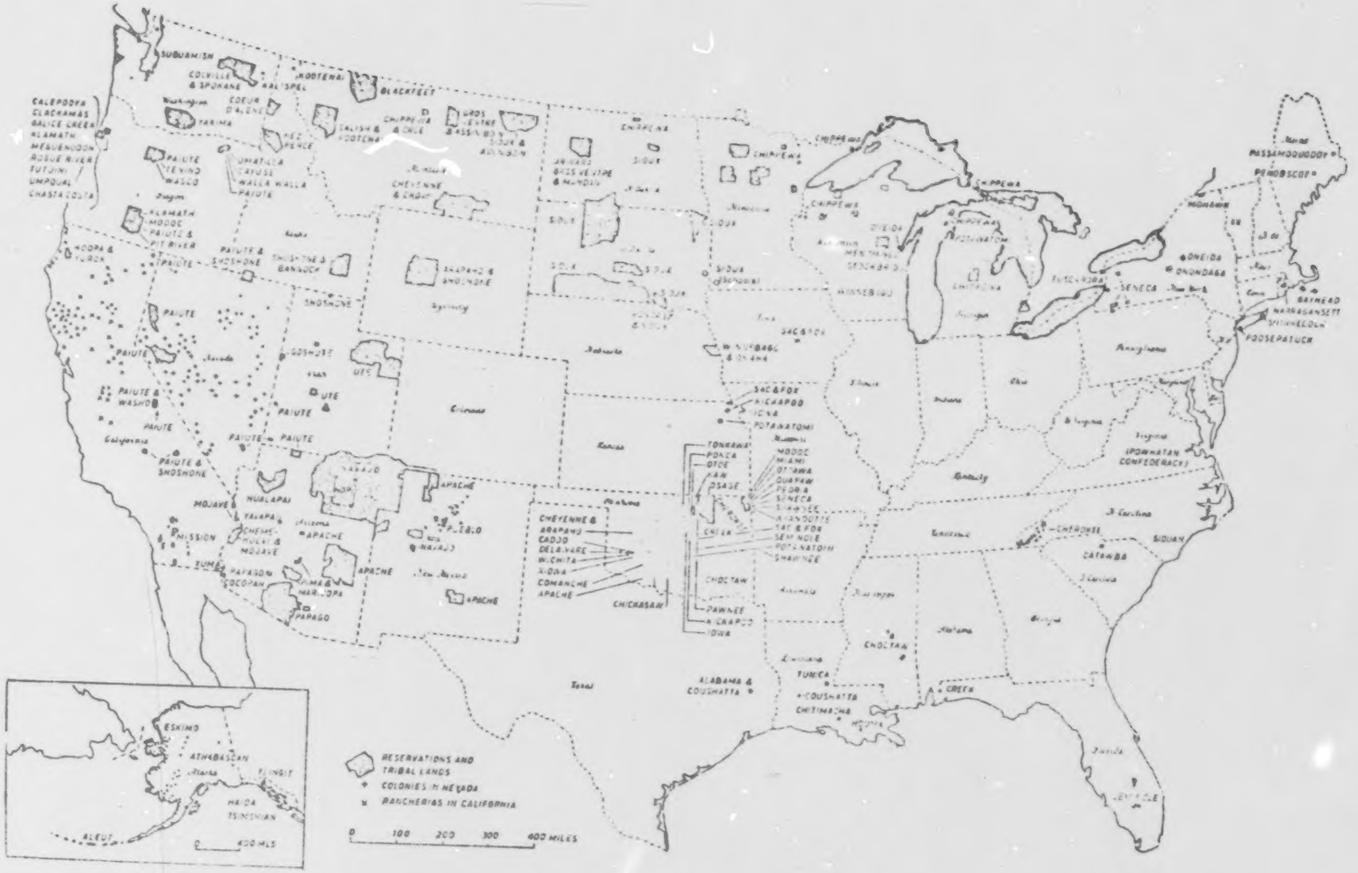
Source: 1970 Census

## TABLE 21

## INDIAN TRIBAL DISTRIBUTION: 1970

| Number of Tribes | Number of Indians | Percent of All Indians |
|---|---|---|
| 4 | 225,664 | 33.2 |
| 12 | 206,842 | 27.2 |
| 130 | 169,545 | 18.4 |
| No report of Tribe | 161,543 | 21.2 |

Source: 1970 Census



SUQUAMISH
COLVILLE & SPOKANE
KALISPEL
KOOTENAI
BLACKFEET
CALEPOOYA
CLACKAMAS
GALICE CREEK
KLAMATH
MOLALLA
ROGUE RIVER
TUTUNI
UMPQUA
CHASTACOSTA
Washington
COEUR D'ALENE
YAKIMA
NEZ PERCE
SALISH & KOOTENAI
CHIPPEWA & CREE
GROS VENTRE & ASSINIBOIN
SIOUX & ASSINIBOIN
PAIUTE
TENINO
WASCO
UMATILLA
CAYUSE
WALLA WALLA
PAIUTE
Oregon
CHEYENNE & CROW
KLAMATH
MODOC
PAIUTE &
PIT RIVER
HOOPA & YUROK
PAIUTE & SHOSHONE
SHOSHONE & BANNOCK
ARAPAHO & SHOSHONE
Wyoming
SHOSHONE
PAIUTE
Nevada
GOSHUTE
Utah
UTE
PAIUTE & WASHO
California
PAIUTE & SHOSHONE
MOJAVE
HUALAPAI
NAVAJO
HOPI
APACHE
YAVAPAI
MISSION
CHEMEHUEVI & MOJAVE
YUMA
PAPAGO
COCOPAH
PIMA & MARICOPA
PAPAGO
APACHE
PUEBLO
NAVAJO
New Mexico
APACHE
Colorado
CHIPPEWA
ARIKARA
GROS VENTRE
& MANDAN
SIOUX
SIOUX
SIOUX
SIOUX
PONCA & SIOUX
Nebraska
SIOUX (SANTEE)
CHIPPEWA
Minnesota
WINNEBAGO
& OMAHA
SAC & FOX
Iowa
SAC & FOX
KICKAPOO
IOWA
POTAWATOMI
Kansas
Missouri
TONKAWA
PONCA
OTOE
KAW
OSAGE
MODOC
MIAMI
OTTAWA
QUAPAW
PEORIA
SENECA
SHAWNEE
WYANDOTTE
SAC & FOX
SEMINOLE
POTAWATOMI
SHAWNEE
CREEK
Oklahoma
CHEYENNE &
ARAPAHO
CADDO
DELAWARE
WICHITA
KIOWA
COMANCHE
APACHE
CHOCTAW
CHICKASAW
PAWNEE
KICKAPOO
IOWA
Texas
ALABAMA & COUSHATTA
Louisiana
TUNICA
COUSHATTA
CHITIMACHA
HOUMA
CHIPPEWA
ONEIDA
MENOMINEE
STOCKBRIDGE
WINNEBAGO
Illinois
CHIPPEWA
POTAWATOMI
Michigan
Indiana
Ohio
Kentucky
Tennessee
Arkansas
Mississippi
CHOCTAW
Alabama
CREEK
Georgia
Florida
SEMINOLE
TUSCARORA
SENECA
New York
ONEIDA
ONONDAGA
MOHAWK
Pennsylvania
W. Virginia
Virginia
(POWHATAN CONFEDERACY)
N. Carolina
CHEROKEE
SIOUAN
CATAWBA
S. Carolina
Maine
PASSAMAQUODDY
PENOBSCOT
GAYHEAD
NARRAGANSETT
SHINNECOCK
POOSEPATUCK
ESKIMO
ATHABASCAN
Alaska
TLINGIT
HAIDA
TSIMSHIAN
ALEUT
0
400 MLS
RESERVATIONS AND TRIBAL LANDS
COLONIES IN NEVADA
RANCHERIAS IN CALIFORNIA
0
100
200
300
400 MILES

Figure 2: LOCATION OF INDIAN TRIBES

---

Source: D'Arcy McNickle, The Indian Tribes of the United States (London: Oxford University Press, 1968.

in language and cultural traits there is much dissimilarity. Unity comes more from the common treatment received and from their common classification given them by the government.

Today, what unity Indians have comes from the similarity in that they are different from the mainstream of society and are treated and regarded as "tribal," and not so much for cultural similarities between tribes. Aspects such as: matrilinear society, cooperative outlook, spiritual outlook, communal life or even cooking and eating habits are not especially similar from tribe to tribe. The varying levels of cultural adaption by different tribes can be used as evidence of their different cultures. Despite inter-tribal dissimilarity there are certain common Indian traits, needs and educational problems that can be addressed together, even though common answers may not be applicable.

Rural and Urban Indian Distribution. The rural-urban distribution is somewhat revealing with 55 percent of Indians in the U.S. living in rural areas while the other 45 percent live in urban areas. Half of the urban Indian population can be found in only sixteen cities listed in Table 22 in descending order of Indian population.

The rural Indian population in the United States was 423,227 in 1970 (3) accounting for less than one percent of the rural American population. Of this total 213,770 lived on reservations, giving almost an even split of the rural Indian population between reservation and off-reservation.

Reservation Dwellers. There are 115 Indian reservations in this country with about 250,000 Indians living on them, comprising

## TABLE 22

### URBAN INDIAN POPULATION IN 16 MAJOR CITIES: 1970

| City | Indian Population |
|---|---|
| Los Angeles | 23,908 |
| Tulsa | 15,183 |
| Oklahoma City | 12,951 |
| San Francisco | 12,041 |
| Phoenix | 10,127 |
| New York | 9,984 |
| Minneapolis/St. Paul | 9,911 |
| Seattle | 8,814 |
| Tucson | 8,704 |
| Chicago | 8,203 |
| San Diego | 6,007 |
| San Bernadino/Riverside | 5,941 |
| Albuquerque | 5,822 |
| Buffalo | 5,606 |
| Dallas | 5,500 |
| Detroit | 5,203 |

Source: 1970 Census

less than one Indian in three living on a reservation. (4) About half of rural Indians live on a reservation, and those that do not often live adjacent to one. The distribution of Indians on reservations is not even among tribes. Figure 2 gives an idea of the geographical location and distribution of reservations. Table 23 shows the tribal distribution on the reservations, which is very uneven.

The one tribe accounting for almost 28 percent of the reservation Indian population is the Navajo tribe. Five tribes accounting for another 40 percent of reservation Indians are Apaches, Chippewas, Papago and Pima, Pueblo, and Sioux. These tribes correspond quite closely to the largest Indian language groups discussed later. The six most populous tribes account for almost 60 percent of reservation Indians.

Languages Spoken by Indians. Of the total Indian population in the United States, 50 percent listed English as their mother tongue in the 1970 Census while only 32 percent listed an Indian mother tongue. Table 24 shows the language distribution. Of reservation Indians, however, the percentage of those listing English as their mother tongue was only 25 percent. Thus one can infer that there is a higher probability of finding English language speaking difficulty on the reservation and less in urbanized areas.

Youth under twenty, comprising the greatest concentration of the Indian population, seem to be more prone to list English as their mother tongue. Indians under the age of twenty-four comprise 62 percent of the population on reservations, and comprise 75 percent of those that listed English in the Census as their mother tongue.

## TABLE 23

## DISTRIBUTION OF INDIAN TRIBES ON RESERVATIONS

| Number of Tribes | Number of Indians | Percent of Total |
|---|---|---|
| 1 | 59,850 | 27.9 |
| 5 | 82,967 | 38.8 |
| 18 | 61,340 | 28.6 |
| 122 | 9,613 | 4.6 |

Source: 1970 Census

TABLE 24

LANGUAGES LISTED BY ALL INDIANS AS MOTHER TONGUE

| | In Percentages |
|---|---|
| English | 50.5 |
| Indian Mother Tongue | 31.9 |
| Spanish | 3.2 |
| French | 1.1 |
| Aleut and Eskimo | 0.2 |
| Other and Not Reported | 13.0 |

Source: 1970 Census

We can infer that the ability to speak English is becoming more prevalent.

Of the quarter million Indians, or 29 percent of all Indians, that listed an Indian mother tongue we find most of the concentration within 16 languages. Those speaking each of the sixteen languages are not distributed evenly among the languages; Navajo language category dominates with 40 percent of those speaking an Indian mother tongue. (5)

Looking at reservation Indians for an indicator of what languages are spoken most frequently the distribution can be seen in Table 25. Five language groups (Navajo, Siouan, Shoshoean, Iroquoian, and Algonquin) comprise 72 percent of the reservation Indians speaking an Indian mother tongue.

Several factors are clear in relation to Indian languages. One is that where the percentage of those not speaking English is the greatest there is a corresponding high concentration of Indians, as on the Navajo Reservation. Another is that five languages groups comprise three quarters of the total non-English speaking Indians. Lastly, rural Indians are the least likely to speak English.

Age Distribution, Dependency Ratio, Family Size. The age distribution is rather like that found in a developing country with a high mortality rate, high birth rate and short life expectancy. The median age for Indians is 20.4 compared to the U.S. median of 28.1 years. This low median age means there are as many Indians aged twenty or younger as there are over aged twenty. The large percentage of young people means an increase in the demand for

## TABLE 25

## FIVE MOST SPOKEN LANGUAGES OF INDIANS RESIDING ON RESERVATIONS

| Language | Percentage of Reservation Indians |
|---|---|
| Navajo | 40.0 |
| Siouan | 9.1 |
| Shoshonean | 6.4 |
| Iroquoian | 7.9 |
| Algonquin | 8.1 |

Source: 1970 Census

services, especially education, and an increased need for employment in years to come. An age structure of this type also indicates a high degree of economic dependence on those earning wages, or a very high dependency ratio. The dependency ratio is well over one or about 50 percent higher than other rural or urban dwellers.

The mean family size for Indians was 5.04 in 1970. The size of urban Indian families was somewhat smaller at 4.39. The rural Indian mean family size was 5.31, much higher than the average American mean of 3.57 persons per family. (6)

Indian Employment, Income and Poverty Status. Only 24.9 percent of the total Indian population was employed in 1970, according to the census. Of the 190,233 Indians employed over one quarter of them were employed for only one half of that year or less. While half of the male "working force" was employed all year. Unemployment is thus exceedingly high. The breakdown for males and females is as follows: (7)

| Weeks Worked | Male | Female |
|---|---|---|
| 50-52 weeks | 49.5% | 35.3% |
| 27-49 | 26.5 | 26.4 |
| 26 or less | 23.9 | 38.1 |

Following is a breakdown of the types of employment in which Indians are engaged. The original Census numbers have been changed to percentages to help put emphasis on categories, rather than on actual counts, because the population is constantly changing and shifting. Remember that the total number of Indians employed, and considered in Table 26, is slightly less than 200,000.

## TABLE 26

## EMPLOYED INDIANS BY TYPE OF INDUSTRY: 1970

(Total 193,233 Indians)

| Type of Industry | | Percentages |
|---|---|---|
| Agriculture, Forestry, Fisheries | | 7.1% |
| Mining | | 1.4 |
| Construction | | 8.1 |
| Manufacturing: | Durable | 14.2 |
| | Non-Durable | 9.0 |
| Transportation, Communications and Public Utilities | | 5.7 |
| Wholesale and Retail Trade | | 13.9 |
| Finance, Insurance, Real Estate | | 2.1 |
| Business and Repair | | 2.8 |
| Personal | | 6.6 |
| Entertainment and Recreation | | 0.7 |
| Professional and Related | | 19.0 |
| Public Administration | | 8.8 |

Source: 1970 Census

Table 27 gives the basic breakdown on per capita income and the percent living below the poverty level. Rural Indian families tend to be somewhat larger than their urban counterparts and thus there is a disproportionately low distribution of income among Indians living in rural areas as seen in the Table. The mean income deficit of Indian families needed just to reach the poverty level is 2,181 dollars. The average rural Indian family is composed of five or six people and their income is probably just below the proverty level.

Table 28 presents general Indian population statistics. Indians comprise less than one percent of the total U.S. population and only about a percent of the rural population. In some areas they represent a significant portion of the population. Indians viewed separately present a combination of high unemployment, low income, large family size, high dependency ratio, and a language and cultural dissimilarity which creates an environment unlike most Americans.

History, Legal Situation, Special Status. Table 29 is a time chart outlining the significant events in the evolving history of affairs between the United States government and the Indian tribes in America. Some events which seem mostly political in nature are important because they indirectly affected Indian education.

Missionaries were the first non-Indians to organize schools for Indians. The first was 1568 when Jesuit Fathers organized a school in Havana, Cuba for Indians from Florida. (8) Various churches through their missionary branches continue Indian education today at mission schools.

## TABLE 27

## INDIAN PER CAPITA INCOME AND POVERTY STATUS: 1970

| Category | Per Capita Income | Percent Living Below Poverty Level |
|---|---|---|
| All Indians | 1573 | 33.3% |
| Urban Indians | 2108 | 21.0% |
| Rural Indians | 1147 | 45.1% |

Source: 1970 Census

## TABLE 28

## GENERAL INDIAN POPULATION STATISTICS: 1970

| | |
|---|---|
| Total Indian Population 1970 | 794,730 |
| Estimated Indian Population 1976 | (1,000,000) |
| Total School Age (5-18) Indians | 213,245 |
| Total Employed 1970 | 190,233 |
| Total Rural Indians | 423,227 |
| Total Number Indians on 115 Reservations | 213,770 |
| Rural Indians Living on less than Poverty Level Income | 198,897 |
| Rural Indians Enrolled in School | 152,788 |

Source: 1970 Census

## TABLE 29

## TIME CHART OF IMPORTANT EVENTS RELATED TO INDIAN EDUCATION

| Date | | Events |
|---|---|---|
| 1568 | - | First school for Indians in America run by non-Indians |
| 1778 | - | First treaty signed by Indians |
| 1836 | - | BIA organized |
| 1887 | - | "Allotment Era" begins |
| 1890's | - | Indian run schools closed by Government |
| 1924 | - | Indians gain right to vote |
| 1928 | - | Meriam report issued |
| 1934 | - | Wheeler Howard Act |
| 1953 | - | "Termination Policy" begins |
| 1966 | - | Indian run school begins at Rough Rock, Arizona |
| 1969 | - | Senate subcommittee investigation on Indian education |
| 1970 | - | Nixon policy of "Self Determination" |

Education was obviously important to Indians because a number of tribes established their own school systems including the Senecas, Choctaws, Creeks, Chicasaws and Seminoles. Cherokees set up a school that taught both their own language, utilizing the alphabet invented by Sequoyah, and English and attained a literacy rate in both languages of 90 percent. (9) Indian run schools were closed by the federal government in the 1890's.

During the past century there have been a number of policy changes in Indian affairs that have changed the character of Indian education. The general Allotment Act of 1887 ushered in the first change. Indians were encouraged to attend public school. During this period of assimilation and acculturation, the Director of the Carlisle School for Indians in Oklahoma expressed the educational policy behind these programs quite clearly when he said: "We accept the watchword. There is no good Indian but a dead Indian. Let us by education and patient effort kill the Indian in him, and save him." (10)

In 1924 Indians received the right to vote and in 1928 the so called Meriam Report (11) came out criticizing Indian policy. During the Rossevelt Administration the Indian Reorganization Act of 1934 was passed ending the Allotment period. The Johnson-O'Malley Act of 1934 was enacted which provides for federal reimbursement to states for the education of Indians in public schools. This Act is operative today.

Indians seemed so Americanized during World War II that in 1953, House Concurrent Resolution 108 was passed formally ushering in the "termination era," in an attempt to end federal involvement with Indians forever. Before the termination policy was ended in the sixties federal control over Indian affairs was dropped in several states. The termination policy was greeted by a new wave of mistrust on the part of Indians. "Fear of termination pervades Indian thinking, it colors the Indian's appraisal of every proposal, suggestion and criticism." (12)

The sixties brought a new spirit under the Kennedy and Johnson administrations with Udall as Secretary of the Interior and new hopes of economic development. An Indian run school at Rough Rock, Arizona opened in 1966. The Senate held extensive hearings on Indian education in 1969 and came out with recommendations including: better funding, organizational changes, changes to eradicate discrimination, more adult education, and more Indian run schools through contacts with BIA. (13)

The closest to a present policy statement was the President's message to Congress in July, 1970. President Nixon said,

> "The time has come to break decisively with the past and to create the conditions for a new era in which the Indian future is determined by Indian acts and Indian decisions." (14)

Nixon established a policy of self-determination by saying:

> "Federal termination errs in one direction, Federal paternalism errs in the other. Only by clearly rejecting both of these extremes can we achieve a policy which truly serves the best interests of the Indian people. Self-determination among the Indian people can and must be encouraged without the threat of eventual termination."

Nixon then turned his attention to Indian education with:

> "One of the saddest aspects of Indian life in the United States is the low quality of Indian education ... Consistent with our policy that the Indian community should have the right to take over the control and operation of federally funded programs, we believe every Indian community wishing to do so should be able to control its own Indian schools. This control would be

> exercised by school boards selected by Indians and functioning much like other school boards throughout the nation."

He also had policy recommendations for Indians in public schools.

> "...Johnson-O'Malley money is designed to help Indian students, but since funds go directly to the school districts, the Indians have little if any influence over the way in which the money is spent. I therefore propose that the Congress amend the Johnson-O'Malley Act so as to authorize the Secretary of the Interior to channel funds under this act directly to Indian tribes and communities. Such a provision would give Indians the ability to help shape the schools which their children attend and in some instances, to set up new school systems of their own." (15)

There is indication that Nixon's statement is being used for operational policy because the 1975 BIA Budget message (16) echoes his policy.

Thus through treaties Indian education became the responsibility of the U.S. federal government.

> "The unique aspect of Indian's legal status is their membership in special political bodies, tribes, which largely take the place that states and municipalities occupy for other American citizens. However, their dependency on and control by, the Federal Government is much greater than state political bodies due to the trusteeship relationship between the Government and the tribe." (17)

The relationship has not been consistent but shifting from assimilation to termination to the present self-determination policy. Mistrust has been created but the relationship continues in a strained manner.

## Indian Education, Status and Issues

> "The issues in Indian education today cut to the core of the problems facing all American education -- the quality of the educational environment, its responsiveness to the rich diversity of American life, the roles of federal and state governments in supporting the educational enterprise,

> and, perhaps most important of all, the degree to which the local community shall share in educational decision making." (18)

Educational Attainment. Twelve percent of rural Indians over aged twenty-five have attended no school and 37,319 or 22 percent have less than a fifth grade education and are thus considered functionally illiterate. A little less than one quarter of rural adult Indians have completed high school. The median school years completed by rural Indians was 8.4 compared to the U.S. average of 12.1, while less than 2 percent completed college. (19) Peer group and tribal pressure, which previously encouraged completion of the eighth grade has generally shifted to encouraging the completion of high school.

Types of Schools for Indians. There are several types of schools available to Indian children, although generally not at the same time in the same area. Table 30 gives a breakdown. There are federal, public, private, mission and a few Indian controlled schools. Indian enrollment in public schools covers the largest category, 65 percent of Indian children, with B.I.A. schools accounting for less than 25 percent. Private and mission schools include another 5 percent, while the "unknown" and "not in school" categories account for the last 9 percent. It should be noted that 87 thousand Indian students in public schools qualified their respective schools to receive federal funds through the Johnson-O'Malley Act.

Thus there are four major categories of schools for Indian pupils. All the categories are run by separate administrations and

/

## TABLE 30

## TYPES OF SCHOOLS AND ENROLLMENTS OF INDIANS AGED 5-18: 1972

| Category | Number | Percentage |
|---|---|---|
| Total number of Indians aged 5-18 | 213,245 | 100.0 |
| Public Schools | 138,519 | 64.9 |
| [Public School Receiving Johnson-O'Malley Funds] | (87,080) | (40.8) |
| Federal (B.I.A.) Schools | 48,605 | 22.7 |
| Indian Run Schools* | (1,000) | (0.5) |
| Mission and Private Schools | 10,087 | 4.7 |
| Not in School | 9,119 | 4.2 |
| Unknown | 6,915 | 3.2 |

*Estimates by author

Source: Bureau of Indian Affairs, Statistics Concerning Indian Education, Fiscal Year 1972.

under separate guidelines. Federal schools answer to the federal government, public schools answer to their local school boards and respective states, Indian run schools answer to Indian school boards and the federal government, while mission and private schools answer to their respective hierarchies or boards of directors.

The smallest category, that of Indian run schools is presently rather insignificant statistically but has more significance politically and educationally. As of 1973 there were less than a dozen schools which had contracts with the B.I.A. to run their own schools with an Indian school board. Many areas are considering such a move and the number is growing rapidly fulfilling the "self-determination" goal.

School enrollment for Indians is at an all time high both in total numbers and percentages. Indian population increase accounts for part of the growth, but the decision by tribes to encourage (most tribes are reluctant to coerce) their members to attend school has also been a factor. B.I.A. statistics for 1972 show a figure of 9,119 or 4.2 percent of the total student population aged five to eighteen not in school and another group of 6,915 "unknown" perhaps not in school. There is thus a 92.5 to 95.8 percent school enrollment for Indians compared to the general population which reaches 97.6 to 99.3 percent. (20) Percentage of Indians enrolling for school is lower than the general population, but increasing.

The 200 thousand Indian students attend some 1400 schools in urban and rural areas. Roessel (21) estimates that there are about 1,000 public schools enrolling Indians and between 150 and 200 mission schools. The B.I.A. operated another 199 in 1972. (22) Most B.I.A.

and mission schools are located in rural areas along with an undetermined number of public schools. Mission schools average fifty Indians per school, public schools average 140 and B.I.A. schools average almost 250 students per school.

The majority of Indian students attend public schools, where they may compose a minority or majority of the student body. Many Indians living on or close to a reservation attend B.I.A. schools. These students are often the ones who, among Indians, are the most exposed to Indian culture, custom and habits. B.I.A. schools are often located on a tract of land removed from a town or village. The physical appearance is very rectilinear with a school building or two with many houses nearby for the faculty and staff. The physical appearance is often in contrast to nearby Indian residences and the spatial and proximity patterns are often quite different. Some of the students may come by bus or other means of transportation to school and return daily, while others live in dormitories.

As federal civil service employees, B.I.A. teachers are employed the full year, rather than just the school year. A report by Fuchs and Havighurst shows that there is really very little difference in the general characteristics between B.I.A. teachers and a national sample of rural public school teachers. The differences are that about 11 percent of B.I.A. teachers are Indians, and a higher percentage of men teach for the B.I.A. than in school settings. (23)

The view of the world as conceived by Indian students may be rather different from that of the teacher. Languages and verbal communication may be very difficult, especially the first few years in school. The Indian student if he lives at the school in a dormitory may have a strong concept of the meaning of school when he must live with others than his family and go to classes taught in other than his own language.

The tribal distribution in schools as reflected in enrollments, resembles the tribal distribution within the Indian population. In the 200 B.I.A. schools serving some 50 thousand Indian students there are nine tribal groups which each have over 1,000 students enrolled as shown in Table 31. The students attending B.I.A. schools from these nine tribes represent 86 percent of the enrollment in B.I.A. schools. Nineteen other tribes have over 100 students enrolled in B.I.A. schools with smaller numbers from remaining tribes.

Funding of Indian Education. Indians attending mission and private schools are funded through private, usually religious organization, sources. Indian students attending public school are often funded, at least in part, by the federal government through several channels. Two thirds of those attending public school are funded through the U.S. Office of Education Public Law 874 which provides funds in lieu of taxes to those eligible. The Johnson-O'Malley Act of 1934 and 1936 allows the B.I.A. to contract with state and local agencies for services to Indians, and this money often supplements P.L. 874 funds. B.I.A. schools are funded directly by the federal government through the Department of the Interior. (24, 25) Indian run schools are funded through contracts with the B.I.A. Public Law 874 and the Johnson-O'Malley Act each provide about 20 million dollars per year for Indian education. The B.I.A. budget estimate for school operations in 1975 is 120 million dollars. (26) The dollar per student cost figure obtained from the B.I.A. expenditures is

## TABLE 31

## TRIBES WITH OVER 1,000 STUDENTS ENROLLED IN B.I.A. SCHOOLS IN DECENDING ORDER: 1972

| | |
|---|---|
| Navajo | 23,964 |
| Sioux | 6,777 |
| Aleuts, Eskimos and Indians (Alaska) | 6,466 |
| Chippewa | 2,498 |
| Pueblo | 2,420 |
| Cherokee | 1,657 |
| Choctaw | 1,532 |
| Hopi | 1,245 |
| Apache | 1,181 |

Source: Bureau of Indian Affairs, Statistics Concerning Indian Education, Fiscal Year 1972.

rather high, but often includes dormitory cost for some students. In addition to the funding shown in Table 32 many schools, including B.I.A. schools receive funds under the Elementary and Secondary Education Act, P. L. 89-10. (27)

Characteristics of Indian Students. The cultural background of an Indian student may give him certain habits, values and behaviors which are not harmonious or synchronous with the general patterns in American education. After extensive examination of Indian education literature, Berry (28) found it possible to develop some generalizations about Indians, despite tribal differences. They were condensed by another source and are presented here. (29)

> "Indians regardless of tribal group, avoid asking for advise or correction from others, avoid coercion, and do not ask favors. They do not interrupt and tend to remain silent until a situation is thoroughly understood.
>
> They place a high value on being sensitive to the feelings of others and upon generosity. They have little concern for the accumulation of personal wealth. This 'Indian way' of sharing one's wealth rather than conserving it for future needs is itself a source of friction between Indian and Anglo societies.
>
> Attitudes of alienation hopelessness, powerlessness, rejection, depression, anxiety, estrangement, and frustration are common.
>
> Another aggravating factor to Anglos is the Indians' lack of time-consciousness (the Sioux do not have a word for time) and their difficulty in accepting the importance placed upon the clock in the Anglo society. They are primarily concerned with the tangible realities of the present and have little regard for planning for the future. They do not accept the idea that hard work is intrinsically valuable, though they are quite willing to devote themselves to a task for long periods of time to meet an immediate, specific need.
>
> They are basically group-oriented and not given to seeking recognition on an individual basis. They prefer to seek harmony with nature rather than mastery over it.

## TABLE 32

## FUNDING OF INDIAN EDUCATION: 1969*

| Type of School | Funding Source | Amount (in dollars) | Number of Students |
|---|---|---|---|
| Mission | Private | N.A. | 10,000 |
| Indian Run | B.I.A. | N.A. | (1,000) |
| Public | Public Law 874<br>Johnson-O'Malley | 20 Million<br>20 Million | 100,000 |
| Bureau of Indian Affairs | B.I.A. | 120 Million (1974)+ | 50,000 |

*Unless otherwise noted Source: (30)

+Source: (31)

> Possibly because they tend to fear the world as dangerous, they feel dependent upon a supernatural power.
>
> In spite of the dominant role played by the group, individual antonomy is valued highly. Even children in many tribal cultures are free to determine their own activities. This, of course, creates problems when the children attend school where the pupils are expected to follow directions, required to conform to rigid schedule, and allowed to make few decisions of their own."

Zintz noted a disparity between the pupil's values and those of the teachers. He found that Pueblo pupils valued harmony, present time orientation, maintenance of the status quo, anonymity, and submissiveness. The teachers prized mastery, future time orientation, competition and success, individuality and aggression. (32)

A situation exists where more and more Indians want to be taught English and marketable skills for our industrial society. At the same time they do not wish to gain these skills at the expense of their tribal identity, their value system, their way of life, and their language. However, there are psychological costs of resisting assimilation. Students are required to choose between traditional tribal and family values and those of school. There are, at present, negative consequences whatever the choice and, "Some make no choice and eventually become alienated from both societies." (33)

Educational Disadvantages of Indians. Because Indian students have not fared well according to the norms as generally defined by the larger society, much has been researched and written about the education and "educational disadvantages" of the Indian student, mostly on the following categories:

1. Percentage of enrollment in school
2. Achievement by standardized tests

3. Overageness
4. Number of years of schooling
5. School completion.

In addition there will be a look at language difficulties and teachers of Indians as these factors seem noteworthy.

It seems more than a question of semantics to ask, after looking at the performance results of the above categories, whether Indians are disadvantaged or the schools that produce the quality of students we witness. It seems clear that by standard schooling criteria, Indians do not meet the norms. Indians, as well as school and government people, are not pleased with the results their children obtain from attending school.

Two of the categories, school completion and percentage of enrollment in school have been briefly touched upon previously. In both categories Indians have not come up to national averages. Discussion of the other categories follows.

Achievement by Standardized Tests. Literature and studies on the achievement level by Indian students on standardized tests is becoming quite prevalent. Figure 3 illustrates in summary form, the results of five research studies done over two decades on achievement of Indian students. According to Fuchs and Havighurst (34) Indians place just below the national average during the first four school years, and then they drop substantially.

A lot of attention is given to the "crossover phenomenon," a concept developed by John Bryde. (35) This theory argues that Indians perform normally with white children in school until about

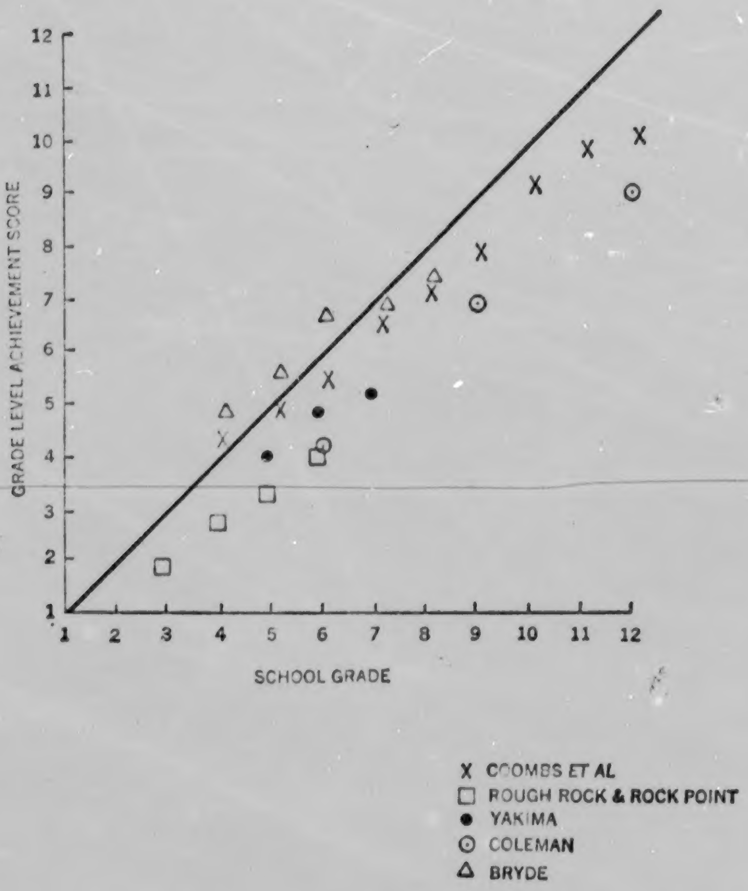


Figure 3

SCHOOL ACHIEVEMENT OF INDIAN PUPILS ACCORDING
TO FIVE RESEARCH STUDIES

Source: Estelle Fuchs and Robert Havighurst, To Live on This Earth (New York: Doubleday, 1972).

the seventh grade when their performance drops in relation to white students until by twelfth grade Indians perform considerably lower. Reasons advanced to account for the crossover phenomenon suggest that abstract concepts, which are introduced in about the sixth grade are not properly comprehended and a gap in understanding begins that is never corrected.

Other observers have pointed out that achievement levels of Indian students may be related to difficulties encountered as a result of cultural disharmony. One study was undertaken by Rosalie Wax, an anthropologist, of school dropouts among the Sioux of Pine Ridge Reservation in South Dakota. Dr. Wax focused on the inability of the school system to respond to the needs of the Indian students. She stressed the dissimilarity of values between the minority subculture and the middle-class oriented schools in her report. Peer-group influences were accented when she wrote the following:

> With most children the peer group reaches the zenith of its power in school. In middle class neighborhoods, independent children can usually seek and secure support from parents, teachers, or adult society as a whole. But when, as in an urban slum or Indian reservation, the teachers stay aloof from parents, and parents feel that teachers are a breed apart, the peer group may become so powerful that the children literally take over the school. Then group activities are carried on in class -jokes, notes, intrigues, teasing, mock-combat, comic book reading courtship-all without the teacher's knowledge and often without grossly interfering with the learning process.
>
> Competent and experienced teachers can come to terms with the peer group and manage to teach a fair amount of reading, writing and arithmetic. But teachers who are incompetent, overwhelmed by large classes, or sometimes merely inexperienced may be faced with groups of children who refuse even to listen.

> We marveled at the variety and efficiency of the devices developed by Indian children to frustrate formal learning-unanimous inattention, refusal to go to the board, writing on the board in letters less than an inch high, inarticulate responses, and whispered or pantomine teasing of victims called on to recite. In some seventh and eigth grade classes there was a withdrawal so uncompromising that no voice could be heard for hours except the teacher's plaintively asking questions or giving instructions. (36)

Overageness. It seems from the literature that overageness, or children being older than the average for a given grade level, is more the rule for Indians than the exception. The Meriam Report (37) observed this as have many subsequent studies. Part of this is explained by the late age of Indians being sent to school, normally at age six or seven rather than at age five. The other explanation is that during the first few years of school when language adjustment and acculturation are occuring Indian children are often held back.

Teachers of Indian Children.

> "There must be about twelve thousand elementary and secondary school teachers who work with more than two or three Indian pupils each day. Probably seven thousand of these teachers are in classes with a preponderance of Indian boys and girls in classes with the following types of schools:

| | |
|---|---|
| B.I.A. boarding and day schools | 1800 teachers |
| Public schools located on or near Indian reservations | 4900 teachers |
| Mission and other private schools | 300 teachers |

> Another three thousand are teaching in public schools with five to fifteen pupils in their classes, mainly in towns and rural areas. Another five thousand are teaching in cities over fifty thousand in population, with two to five pupils, enough to make them aware that they work with Indian pupils." (38)

Most discussion of teachers of Indians centers on B.I.A. teachers who do not comprise the majority. Many of the public school teachers who comprise the majority that teach Indians are found in urban school settings.

There is considerable mention in the literature about the high turnover and drop-out rate of teachers of Indians especially after the first year or two of teaching. This characteristic seems to be prevalent among rural and small town teachers generally, not just of Indian teachers. Isolation from people is a problem for teachers, as well as contact with and access to amenities like housing, television reception, and shopping facilities. Perhaps the most important factor is that urban and larger communities can offer higher salaries and more in-school services for teachers.

Training programs seem few and inadequate for teachers of Indians. Little contact seems to occur between teachers of Indians and Indian parents and community. There are no incentives for such contacts and little encouragement to develop better programs or to adjust curriculum to the needs of the area, such as range management or native crafts. Likewise there is little compensation through salary for the hardships if isolation and teaching difficulties. Length of time on the job is the greatest single factor in gaining increments and raises, and these gains do not represent large sums of money.

Jack Forbes of the Far West Laboratory for Educational Research and Development has developed an outline of the needs for training the teachers of Indians. His ideas are presented here for they show the need for sensitivity and relevance to Indians.

> A good professional training program should seek to develop an intensive training process which will involve the cooperation of Indian adults, institutions of higher education and other agencies. This training program should be designed to 1) acquaint the teacher with the theoretical background of working with culturally different and low-income pupils, 2) acquaint the cross-cultural contacts, 3) make the teacher aware of the cultural and class assumptions and/or prejudices which he or she possesses, 4) throughly acquaint the teacher with the general history and culture of American Indians, 5) specifically acquaint the teacher with the particular local population's history, culture, and present situation, and 6) provide direct practical experience at working with minority adults and youth derived from that particular population.
>
> It is especially important to stress that any such training program should be under the over-all direction of the local Indian community wherever feasible and should, at a minimum, involve at least co-direction by the local community. (39)

Indians, unlike most American students, are taught by people who, in more cases than not, do not know their language, their values, their backgrounds and strengths. The teachers if they are Indian are possibly from a different tribe, but are probably not Indian. Higher pay is needed to attract and keep quality teachers along with training above and beyond traditional teacher preparation.

Bi-Lingual Education. There seems to be a lack of information available on the number of Indians that enter school speaking a Native tongue and not English. "The B.I.A. estimates that two-thirds of children attending its schools do speak another language. The percentage for public school is unknown but it is probably much lower." (40) Two-thirds of the B.I.A. total yields 35,000 Indian children. Assuming that 40 percent of the 87,000 Indian children in public school receive Johnson-O'Malley funds, there would be another 35 thousand students entering school not speaking English. There is then in the neighborhood of 70 thousand Indians starting school each year speaking a Native tongue; yet in 1972 there were only three B.I.A. Indian bilingual education programs covering forty-eight schools. (41)

The distribution of students speaking Indian mother tongues follows closely the distribution of all Indians speaking Indian mother tongues. The B.I.A. and the Census again provide a profile. The B.I.A. has censused from one to 22,964 students from 137 tribes. (42) Five tribal groups: Aleuts and Eskimos of Alaska, Navajo, Sioux, Shoshone, and Pueblo comprise 83 percent of the six to fifteen year old Indians with Indian mother tongues living on reservations. (43) The first three tribes just mentioned provide 67 percent of students enrolled in B.I.A. schools in 1972 (44) Indian mother tongue students are thus, for the most part, located in several concentrated places and speak half a dozen languages.

English as a second language (ESL) is basically a teaching system where children can speak their native tongue, whatever it be, on entering school. During the next few years English is taught and some instruction is given in English; students can speak whichever language they wish. By about fourth or fifth grade English is used entirely. On the other hand Bilingual Education utilizes both languages all through school and the student may switch languages at any time. There is still much discussion over various bilingual education programs which are not widely used in this country.

There are many interrelated aspects of bilingual education that seem to address many of the problems that cause poor attainment levels for Indians. The following, taken from U.S. Senate hearings on bilingual education give the basic arguments for bilingual education where both languages are used. These comments also apply to some extent to English as a Second Language (ESL), and bilingual-bicultural education.

> "Proponents of bilingual education also argue that it is a more humane approach to instruction, avoiding the frightening, frustrating experiences of the non-English speaking child in an all-English environment. They argue further that there is evidence that bilingual instruction makes for improved intellectual functioning; that it indicates respect for the native culture and helps retain pride. Proponents also argue that bilingual programs provide employment for native speakers as teachers, consultants, and in curriculum development; and that community and parental involvement with the school is more likely to occur with a bilingual program. Bilingual education is proposed not simply as a bridge to the past, but for its positive value in providing familiarity and skill in the handling of different cognitive systems. In a multinational, multiethnic world language is seen as a key to identity and protection against alienation and disorientation." (45)

Arguments against bilingual education include the fact that it is not a proven technique, it is costly, teachers often have to be retrained or new ones hired, and that only English in school is relevant.

Indian Education Advocacy Groups. Because of the U.S. government shifting policies and virtual domination over Indian affairs there has been little hope that any ideas or requests registered through an Indian education advocacy group would benefit. Now with U.S. government policy moving in the direction of self determination for Indians there are few articulate Indian groups to advance Indian positions on education.

There are at least two existing government initiated groups which represent Indian educational interests. They are the National

Indian Education Advisory Committee which reports to the Commissioner of Indian Affairs and the other group is the Subcommittee on Indian Education of the National Council on Indian Opportunity. Both groups report to or advise U.S. government bodies; the first group advises the B.I.A., the second reports to the Vice-President. (46) Many have urged that these groups be given more responsibility and larger budgets. It has been suggested that Indians should start a group to render educational advice to tribal groups in addition to the government because self-help would be most constructive at present during the self determination period.

Although not advocating Indian education primarily there are other Indian organizations that should not be neglected. Three well recognized groups are: The National Congress of American Indians, The National Tribal Chairmen's Association and The National Indian Youth Council. Other groups including the American Indian Movement (A.I.M), the All Indian Pueblo Council and The Tribal Council of the Navajo tribe are gaining recognition and power. The lack of one clear goal or one clear group is not conducive to articulation of a precise definition of where Indian education is headed. As one Indian leader expressed, "Education has got to accommodate itself to Indian needs." (47) Indians, however, must take the upper hand in making education accommodate their needs. The trajectory, unclear at present, is gaining in velocity and intensity.

The Rough Rock Demonstration School was the first Indian school to be run by an Indian school board. This small school is located on a relatively isolated spot on the Navajo Reservation in Rough Rock, Arizona. In 1966 the school began operation on a contract basis with the B.I.A. The Rough Rock Demonstration School has shown everyone that Indians through cooperation, local autonomy and responsibility can effectively operate a school with bicultural, bilingual education. (48)

## Indian Education Telecommunications Projects

Telecommunications technology has been applied to some Indian education settings in the past few years. The motivation for these projects have been provided both by organizations outside the Indian communities wishing to apply or test certain telecommunications projects with Indians, and from inside Indian communities through various decision making processes. Some of the projects will be described to give a view of the application and impact, and potential impact of telecommunications to help meet the needs of Indian education as discussed earlier.

Ramah Radio Project. On the eastern end of the Navajo reservation in New Mexico is a subdivision of the Navajo tribe known as the Ramah Navajo Community. Covering 1000 square miles, the area is sparsely vegetated and sparsely populated with about 1400 individuals constituting roughly 230 families. Based upon experiences with the Rough Rock Demonstration School, the Navajos in Ramah decided they wanted to run their own high school and subsequently became the first Indian High School to do so since the 1890's.

> "The school is run by an all-Indian school board, three members of whom do not speak English, none of whom have high school diplomas.
>
> Ramah is not experimental in the sense that Rough Rock was and the terms of its grants do not require that it run anything but a traditional school with a standard curriculum.

> The inclusion of Navajo culture is its major curricular difference from that of the New Mexico public high schools. Its major innovation for the Ramah Community has been the infusion of excitement and interest as well as the encouragement of formal, active involvement of parents, teachers, children, and school board members in the development of their own community school, which makes it possible for students to continue to live at home. (49)

The Ramah Navajo School Board, Inc. also decided to utilize telecommunications technology in carrying out its objectives. In 1972 they obtained a license to operate a 2.6 kilowatt FM radio station with the call letters of KTDB standing for Tl'Ochini Dinee Bi-Radio, which means, in Navajo, "radio of the people." The radio was brought into the high plateau area to address three broad goals and eleven objectives: (50)

> KTDB Goals
>
> 1. To reunite divided families and restore the family to its central role in society.
> 2. To create a community whose members are well-enough informed to make knowledgeable, responsible decisions in all areas that affect their lives -- e.g. health, education, politics and economics.
> 3. To help the community develop a mode of living which satisfactorily blends elements of traditional Navajo culture with new ways made necessary by living in close and constant contact with 20th Century Anglo society.
>
> Objectives
>
> In order to work towards the above goals the following objectives have been established:
>
> 1. To increase the level of information about, and knowledge of, local attitudes and opinions of issues of local importance.
> 2. To acquaint community members with the terminology and processes of education.
> 3. To increase knowledge in specific content areas: nutrition, health, law, consumer affairs, government, agriculture and husbandry.

5. To increase knowledge of agencies and available services.
6. To increase the number of Navajo people with professional skills in broadcasting.
7. To increase knowledge of people, places and events outside the Ramah community.
8. To expedite the communication of specific messages.
9. To help improve basic skills in the adult community.
10. To increase the amount of entertainment available in homes.
11. To increase awareness of and respect for Navajo culture and language.

As of 1973 the Ramah Navajo was on the air about 12 hours a day, six days a week. Much of the programming is in Navajo. If an interview is taped in English it is generally translated and then both versions are broadcast consecutively. The full time staff of six includes four Indians, among them the first licensed 1st Class Navajo radio broadcaster. There are also several Indian students from the high school who serve as operators and disc jockeys. Many programs are taped at the high school by the students and these include: interviews, talks by a public health nurse, stories, translations, reports from the faculty and special interest events.

> "Community participation has been the single most encouraging aspect of the radio program so far. The experience of Ramah Navajo Radio would seem to support the contention of some media students that oral cultures adapt more readily to radio medium than do others. We have often observed Navajo people with little or no education sit down before a microphone and deliver an articulate monologue on a subject of concern to them for a half hour to an hour with hardly a pause for breath. And there is surprisingly little reluctance about using the radio. As mentioned above, local people will often initiate a request for air time, and when approached with a request to participate in programming, they are almost always willing to do so." (51)

This experience suggests that telecommunications technology can be adapted to the needs of Indians.

In addition to locally originated material KTDB, utilizes tapes from National Public Radio as well as tapes from Canada and Alaska that are either by or about Indians in those regions. In order to keep in touch with the outside world the station rents a UPI teletype and the news of interest from UPI is then translated to Navajo and broadcast to the community.

Ramah Navajo Radio station is an FM facility broadcasting at 89.7 MHz with a 2.6 kilowatt transmitter. Two hundred transistor radios were distributed to Indians in Ramah at the onset of the broadcasting project, April 1972. The hardware costs were met by funds from OEO and BIA. There was considerable concern over continuation of funding for operation expenses because such an endeavor, to date, was unusual and B.I.A. procedures for handling telecommunications proposals were not established. The 1973-74 yearly budget needs for the station upkeep, salaries, UPI hook-up, tapes, records, taped programs and all miscellaneous needs came to 80,000 dollars. (52) Per family cost is thus about 350 dollars per year.

One of the significant elements of the Ramah Navajo Radio is that the motivation for the radio station came from within the community following discussions concerning the educational goals of the local community. Technical expertise was brought in from University of Wisconsin for consultation and feasibility studies. The technical people were retained to get the facilities constructed, equipped, and operational. It is inspiring to think that in an area with an average family income of less than 2,000 dollars and despite language problems, a group of Navajos could provide the impetus to develop a telecommunications system to address their communications and educational needs.

Isleta C.A.I. Project. The Isleta Pueblo, one of 19 Indian Pueblos in New Mexico, is located 20 miles south of Albuquerque. Within the Isleta Pueblo is a B.I.A. Elementary School with 285 students which provides the setting for a Computer Assisted Instruction (C.A.I.) project initiated by Stanford University, in California.

Adjacent to the library in the Isleta Elementary School is a small room with 10 teletype terminals. The terminals were originally intended to be connected via satellite microwave communications with a computer at Stanford University. Technical difficulties developed and a telephone line connection between Stanford and Isleta was used instead. The phone line costs ran about 1000 dollars a month and the long line connection was said to be technically unreliable. A mini-computer was installed at the Isleta site in 1973 by Computer Curriculum Corporation, started by Patrick Suppes of Stanford. Mike McFarland was the person responsible for day to day operations of the C.A.I. equipment, instructional supervision of the Indian students and coordination with Stanford.

The purpose of this project is to test the effectiveness of C.A.I. on Indians in three skill areas: Language Arts, Reading, and Math. The users must utilize the English language and they only take two or three days to learn to use the typewriter. The students "hunt and peck" for the letters because they are not taught the touch type system of typing. (53) The drills are not ethnically oriented. The program makes certain allowances for the children to work at their own pace. They are allowed a predetermined amount of time to answer each question before the computer calls time, answers the question correctly and proceeds to the next question. Depending on past performance on each drill series each day, the students next day's drills are selected. A student may receive any of a set of drills each day. Problems encountered by a student in a certain area can be caught by the program and the student will receive further drill in the problem area before progressing. Students can thus progress at individual rates.

The fact that children are routed to remedial material if comprehension in an area is inadequate, and the intensity of individual drilling contribute to positive results according to McFarland. Drilling seems to help the "slow" students most, bringing them more up to par with the other students. "Average" students don't experience as much gain but receive reinforcement instead. (54)

The principal of the school, Francis Mansfield, an Indian, expressed to this author some of the difficulties encountered in implementing and evaluating the C.A.I. project. He was concerned because the C.A.I. program material was not co-ordinated with the material teachers were covering in the classrooms. In addition new Title I and Title VI projects were producing results, which, according to Mansfied, could not be separated from those produced by the C.A.I. project. (55)

The Office of Experimental Projects and Programs, National Science Foundation has continued funding for 1974 of the Isleta C.A.I.

Project under the University of New Mexico. (56) The project is now under the direction of Sophie D. Aberle and will continue with the minicomputer supplied by Computer Curriculum Corporation. Evaluation will be conducted by Professor Suppes of Stanford University, who initiated the project. Funding for 1974 is 31,500 dollars. (57) This research should indicate the potential usefulness the role C.A.I. drill and practice can provide to Indian students.

Jicarilla Closed Circuit TV. In the small town of Dulce on the Jicarilla Apache Reservation in northern New Mexico is a school with a closed circuit TV system. In an isolated section of the state with 100 square miles live some 2600 Apaches and whites. There are 600 students in school from kindergarten through high school. The closed circuit system serves not only the school but also 150 homes in the town which are connected by cable.

The school owns and runs the TV system which was initiated after a decision by a majority of the school board members. Title 1 funds were used to establish the system and Johnson-O'Malley funds provide continuation money. Every classroom has a television set connected to the closed circuit system. About 10 percent of the material in school is presented through the medium of television. There are television programs of about 2 hours duration during each school day. Some programs are received from the educational television station in Albuquerque such as "Electric Company," science, reading and music material. Many programs are generated at school. When programs will be shown in the evening to the families living in town, the school children are sent home with notices about what will be shown. All staff members receive in-service training to learn to use the media.

Television, when integrated with other techniques of presentation, has been found to be a valuable addition to the educational environment at Dulce. Evaluations are conducted on the effectiveness by students and teachers. The closed circuit TV has been a "good image builder" for teachers, students, parents and the community. (58)

## Tribal Telecommunications

*Navajo Communications/Education Development*. Ralph Casteel, Communications Director for the Navajo Nation, states that the goals for the Navajo Nation are to reach all Navajos on the reservation by telecommunications and for Navajos to own and run their own radio and television stations. They are making slow, steady modest beginnings. They have 11 hours per week presently on the air on nearby television stations. The Navajo-speaking announcers are provided by the tribe to the commercial stations which allot time for Navajo language programs developed by the Navajo Tribal government. Success of the Navajo programming is shown by the 400 percent increase in the sale of battery powered television sets to Navajos since the inception of the programs with Navajo announcers.

Casteel's goal is to provide material via telecommunications in the following categories and distribution:

| | | | |
|---|---|---|---|
| Educational Material | 50 percent | News-Type Format | 20 percent |
| Health Information | 20 percent | Economic-Social Development | 10 percent |
| Documentaries | Occasionally | | |

This is an example of a tribe initiating steps to provide electronic telecommunications, much of which is educational material, to its members.

In an attempt to reach Navajos on the 26,000 square mile reservation, two corporations have been established; Navajo Audio-Visual Communications Organization (NAVCO), a profit making organization; and Navajo Corporation for Public Broadcasting (NCPB) a non-profit organization. Profit from NAVCO will support NCPB. Plans call for the educational material to be broadcast by NCPB from 6 am to 4 pm and from 4 pm on the advertisement portion from NAVCO is to be broadcast.

This plan is considered, by Casteel, to be a "self-sustaining vehicle design" for the tribe. It is too soon to be certain that the material produced will be used in the schools, but Casteel hopes this will occur once a station is obtained. Development time is needed before the workability of the Navajo plan can be evaluated. (59)

Pueblo Telecommunications. The Pueblo tribes of New Mexico have organized themselves; their organization is called the All Indian Pueblo Council. There are nineteen tribal Pueblo groups within the organization. Among the nineteen tribes there are four Indian languages in use, Keresan, Tanoan (Tewa and Tiwa dialects), Zuni, and Shoshonean. Under the leadership of Ernest Lavato, their communications chairman, they are attempting to adapt mass communications (including newspapers, TV, radio) media to their needs and to mold the commercial media networks to meet their needs. They are in the process of developing a newspaper, radio station and media school. The Council is taking legal action against local networks for not meeting Indian needs and not hiring Indian employees. (60)

Although clear plans do not yet exist, it seems likely that educational uses of telecommunications will be forthcoming. The technical advisor from the Ramah Radio Project has been hired and is undertaking feasibility studies for the Pueblo council. Again this is an example of a tribal group addressing their informational and communications needs with telecommuncations.

Other Telecommunications Projects . Alaska has experienced the first large scale educational telecommunications project using the NASA ATS-1 satellite for radio communications between some twenty-six Alaskan locations. (61) ATS-6 will include more experiments in telecommunications to remote Alaskan and Rocky Mountain schools. These projects will be described in Chapter V. There are several other radio and closed circuit TV programs at B.I.A. schools according to the Cablecommunications Resource Center. (62) One Indian owned cable system exists but is not yet producing programs. Several sources are training people to produce media or are presently producing media, they include: Alberta Native Communications Society, Duluth Indian Action Council Motivation Through Communication, and Indian Telecommunications Project. (63)

## Summary

It seems too early to evaluate the precise impact telecommunications is having or could have on Indian education. Both Indians and non-Indians are trying to apply telecommunications technology in its various forms to try and meet needs of communication in an educational environment often isolated and compounded with language and cultural difficulties. Despite questions of politics, funding and Indian control there seem to be information needs for rural education programs which are amenable to telecommunications technology dissemination. Because of isolation, small school scheduling and uneven teacher preparation and training there is a need for more standardized general, basic and supplementary education material for elementary and secondary education. Indians are generating a demand for material by and about Indians including topics like: law, culture, economic development, politics and history. Each Indian language population has needs for information in the native tongue to learn English and to learn about the wider world. Adult basic education and especially specific vocational training material seem to be a consistent need in all areas. All of these needs can be met to some extent through centralized program development and telecommunications dissemination. Control, funding, operation and coordination of such projects still requires research, articulation and refinement.

# CHAPTER III

## Footnotes

1. T. C. McLuhan, Touch the Earth (New York: Outerbridge and Dienstfrey, 1972).

2. U.S. Department of Commerce Census Bureau, 1970 Census, Special Report PC(2)-1F: Indian Americans. (Washington, D.C.: Government Printing Office).

3. Ibid.

4. Ibid.

5. Ibid.

6. Ibid.

7. Ibid.

8. U. S., Department of the Interior, B.I.A., Office of Education Programs, Statistics Concerning Indian Education Fiscal Year 1972 (Washington, D.C.: Government Printing Office).

9. Estelle Fuchs and Robert Havighurst, To Live on This Earth (New York: Doubleday and Co., 1972).

10. T. Nelson, Efforts to Rehabilitate the Standing Rock Sioux, (unpublished thesis in North Dakota State University Library, 1965), quoted in Donald L. Burnett, Jr., "An Historical Analysis of the 1968 Indian Civil Rights Act." Harvard Journal on Legislation, Vol. 9, No. 4, (May 1972).

11. Lewis Meriam, The Problem of Indian Administration (Baltimore, Maryland: John's Hopkins Press, 1928).

12. E. Cahn, Our Brother's Keeper: The Indian In White America (New York: World Publishing, 1969.)

13. L. Madison Coombs, The Educational Disadvantage of the Indian American Student (New Mexico State University, 1970).

14. U.S., President 1969-74 (Richard M. Nixon), Message to Congress, July 8, 1970, Document No. 91-363, (Washington, D.C.: Government Printing Office, 1970).

15. Ibid.

16. Department of Interior, Bureau of Indian Affairs, Budget Estimates, Fiscal Year 1975 (Washington, D.C.: Government Printing Office, 1974).

17. Ralph Nader, "American Indians: People Without a Future," The Harvard Law Record, Vol. 22, No. 10, (May 10, 1956), Quoted in U.S. Senate, Subcommittee on Indian Education of the Committee of Labor and Public Welfare, Hearings, 91st Congress, 1st Session (Washington, D.C.: Government Printing Office).

18. Estelle Fuchs, "Time to Redeem an Old Promise," Saturday Review, (Jan. 24, 1970) 55.

19. 1970 Census, op. cit.

20. L. Madison Coombs, op. cit.

21. Robert A. Roessel, Jr., Handbook for Indian Education (Los Angeles, California: American Publishing Co., no date).

22. B.I.A., op. cit.

23. Fuchs and Havighurst, op. cit.

24. Ibid.

25. B.I.A. op. cit.

26. The Institute for the Development of Indian Law, Legislative Review, Vol. 2, No. 9, (1974).

27. B.I.A., Statistics Concerning Indian Education, op. cit.

28. Brewton Berry, The Education of American Indians, (Washington, D.C.: U.S. Government Printing Office, 1969).

29. Eva Mackin, William A. Lybrand, Frank Atelsek, Robert Manske, ITV and Education of Children of Migrant Farm Workers, Indians and Inner-City Poor: Cross Cultural Comparisons of International Uses of Media (Washington, D.C.: Development of Education and Training Research Institute, the American University, Jan. 1971).

30. Fuchs and Havighurst, op. cit.

31. Legislative Review, op. cit.

32. Miles V. Zintz, 1969 Senate Subcommittee Hearings on Indian Education, op. cit, Part 2, p. 1635.

33. Eva Mackin, and others, op. cit.

34. Fuchs and Havighurst, op. cit., p. 124.

35. John S. Bryde, The Sioux Indian Student: A Study of Scholastic Failure and Personality Conflict (Vermillion, South Dakota, Dakota Press, 1970, quoted in Fuchs and Havighurst, op. cit).

36. Rosalie H. Wax, "The Warrior Dropouts," TRANS-action, Vol. 4, No. 6 (May 1967) p. 45, quoted in Fuchs and Havighurst, op. cit., p. 249.

37. Meriam, op. cit.

38. Fuchs and Havighurst, op. cit., p. 124

39. Jack D. Forbes, Native Americans of California and Nevada, (Berkeley, California: Far West Laboratory for Educational Research and Development, 1968).

40. Fuchs and Havighurst, op. cit.

41. B.I.A., op. cit.

42. Ibid.

43. 1970 Census, op. cit.

44. B.I.A., op. cit.

45. U.S., Senate, Hearings on Bilingual Education, 90th Congress, 1st Session. (Washington, D.C.: Government Printing Office), quoted in Estelle Fuchs and Robert J. Havighurst, To Live on This Earth (New York: Doubleday, 1973).

46. Fuchs and Havighurst, op. cit.

47. Gerald T. Wilkinson, Exec. Director, National Indian Youth Council, Inc., Albuquerque, New Mexico, personal interview, October 16, 1973.

48. Fuchs and Havighurst, op. cit.

49. Ibid.

50. F. Kim Hodgson, Ramah Navajo Radio Continuation Proposal (Ramah, New Mexico: mimeographed, April 1973).

51. Ibid.

52. Ibid.

53. Personal interview with Mike McFarland, October 15, 1973, Isleta, New Mexico.

54. Ibid.

55. Personal interview with Francis Mansfield, October 15, 1973, Isleta, New Mexico.

56. National Science Foundation, Office of Experimental Projects and Programs, Technological Innovation in Education, *1974 Awards* (Washington, D.C.: N.S.F., mimeographed 1974).

57. Ibid.

58. Telephone interview with Ms. Chon LaBrier, Asst. Principal, Dulce School, Dulce, New Mexico, May, 1974.

59. Information obtained from Ralph Casteel, Communication Director, Navajo Nation, personal interview, October 19, 1973, Window Rock, Arizona.

60. Personal interview, Ernest Lavato, October 15, 1973, Alburquerque, New Mexico.

61. Alaska Educational Broadcasting Commission, *A Proposal to Develop a Plan for Unique and Innovative Education Demonstrations in Alaska Employing ATS-F*, a proposal submitted to the Department of Health, Education, and Welfare (April 21, 1972), quoted in Kenneth A. Polcyn, *An Educator's Guide to Communication Satellite Technology* (Washington, D.C.: Academy for Educational Development, Inc., September 1973), p. 40.

62. Mary Ellen Ayres, "Native Americans Find New Uses for Radio-TV," *Cablelines,* Vol. 2, No. 2, (February 1974).

63. "Telecom in Native America: Where It's At," *Cablelines,* op. cit.

## CHAPTER IV

# MIGRATORY FARM WORKERS, MIGRANT EDUCATION, AND MIGRANT TELECOMMUNICATIONS PROJECTS

## Introduction

This chapter is concerned with farm workers who migrate in order to gain employment in agricultural production. After a short descriptive and historical section, the number, location and movement of migrants is examined. Educational attainment levels, present educational situation and needs are discussed, followed by the presentation and analysis of information about telecommunications projects related to migrant education.

## Migratory Farm Workers Role in the Economy and Position in Society

Introduction. "In 1968 with cash receipts from farm marketings over $48 billion, food was this country's largest industry. The $124.6 billion consumers spent for food during the year was over 23% of their consumption expenditures." (1) "Agriculture and agriculture-related industries, including farm equipment and supplies, and the food processing and marketing industry combined employ around 16.5 million people, or about one-fifth of the total U.S. labor force." (2) Agriculture is a significant sector of the food industry. In 1971 there were about 2.6 million persons aged fourteen or over who did some farmwork for cash wages during the year. (3) A sub-sector of the agricultural working force are those called migratory farm workers. The major distinguishing factor of migratory farm workers is that they move from place to place in order to gain employment in agriculture. The movement factor in turn produces other problems, life styles and factors.

From the employer's point of view, migratory farm workers are a labor force which they can utilize for a short period of time to perform needed tasks. When not needed migrants are viewed by the employers as an unwanted burden and liability. (4)

From the farm worker's point of view, the migrant stream is chiefly a source of income. To some it is a lifelong occupation; to others a temporary situation which they will leave for other jobs and life-styles. For many coming into this country, farm work provides a stop-gap situation, or transition phase. Others such as displaced sharecroppers often become migrants in their search for new employment. Unfortunately, many people accept a farm work job for a day, then a week and continue to believe that such a position is temporary. Many migrants resent their jobs and status, deny that they are migrants and believe they will soon change their patterns. (5)

There are few requirements for becoming a farm worker, except a minimal physical ability to perform the work. Economic, social, educational and even language barriers are overlooked. The often practiced method of hiring for one day at a time lends itself to a situation where people can enter and leave the farm worker occupation virtually every day. A single move over county lines to gain employment in agriculture makes a person a migrant farm worker.

There is much variation in length of stay among the migrant population. Some individuals never leave the migrant stream whereas others may be involved for only a few weeks.

History of Migrant Farm Labor. Foreigners have historically been, and continue to be, a source of labor that will work for low wages under less than desirable conditions. A supply of foreign labor that works for low wages enlarges the labor supply and can create a surplus labor market thus keeping wages low because there is an over supply in relation to the demand. There have been many sources of foreign labor. Mexico has been a long term, large volume supplier dating back to the time when parts of Mexico became the United States. From 1850 to 1889 European and Oriental laborers were imported and utilized. (6) "In the west, as late as 1880 nearly 90 percent of California's field labor was performed by Chinese coolies." (7)

The Northeast of the United States relied on European immigrants after the turn of the century for farm labor. In New Jersey for example large numbers of Italian immigrants were to be found working on farms in the 1920's. (8) "During the Depression more than 200,000 dispossessed "Okies" and "Arkies" came out of the midcontinent Dust Bowl." (9) This situation was described by Steinbeck in the classic novel, The Grapes of Wrath. (10)

> Pa said, "We Seen them han'bills. I got one right here." He took out his purse and from it took a folded orange handbill. In black type it said, "Pea Pickers Wanted in California. Good Wages All Season. 800 Pickers Wanted." (a stranger commented)... "You'll be a-campin' by a ditch, you an' fifty other famblies. An' he'll look in your tent an' see if you got anything lef' to eat. An' if you got nothin', he says, "Wanna job?'

> An' you'll say, 'I sure do mister. I'll sure thank you for a chance to do some work.' An' he'll say, 'I can use you. An' you'll say, 'When do I start?' An' he'll tell you where to go, an' what time, an' then he'll go on. Maybe he needs two hundred men, so he talks to five hundred, an' they tell other folks, an' when you get to the place, they's a thousan' men. This here fella says, 'I'm paying' twenty cents an hour.' An' maybe half a the men walk off. But they's still five hundred that's so goddamn hungry they'll work for nothin' but biscuits... The more fellas he can get, an' the hungrier, less he's gonna pay. An' he'll get a fella with kids if he can...

In addition to Steinbeck the early days of migrants are well described by James Agee (11) and Carey McWilliams (12).

The second World War created labor demands in agriculture and Mexicans filled much of the demand in the west through an agreement allowing for temporary contract labor, known as the Bracero Program. War prisoners from Italy and Germany were used for farm labor on the East Coast during the second Warld War. Displaced southern Black sharecroppers provided the major source of migrant farm labor on the East Coast after the Depression. Since World War II there have been few europeans entering the farm labor market. Puerto Ricans, Cubans, Virgin Islanders, Filipinos and Mexicans have been the major foreign sources. The Bracero Program was terminated at the end of 1964. The present composition of the work force is predominantly Mexican-American, with large numbers of Blacks in the East. Other groups, including Whites, Puerto Ricans, Filipinos, Indians and Japanese are to be found.

Recent descriptive accounts of migrants have been written by several authors including Truman Moore (13) Steve Allen (14), and Dale Wright. (15) Accounts of migrants dealing with cultural and psychological aspects have been done by Robert Coles (16) Wiliam

Friedland (17) and Jay Perrine (18) among others. The mobility, rootlessness and alienation are the major factors that have caused subcultural trait development.

Definition of Migrant. The definition of migrant farm workers given by the U.S. Department of Agriculture is a generally accepted definition:

> "Farm wageworkers are classified as migratory, if during the survey year they left their homes temporarily (at least overnight) to do farmwork for cash wages in another county within the same state or in another state with the expectation of returning home at the conclusion of their period of farm wagework. Persons who had no usual place of residence and did not farm wagework during the year in two or more counties, either in the same or different states, were classified as migratory farm wageworkers." (19)

This definition is acceptable from the point of view of this study. Within the definition of persons who cross county lines are both intrastate migrants and interstate migrants.

There is another category of farm worker that crosses international borders to perform farm work. Those that enter the United States on a work contract basis, such as from the British West Indies, come strictly for agriculture employment, do not bring their families and return immediately upon completion of the contract. Persons designated as "foreign labor" are not to be confused with persons who are immigrants, such as from Mexico, whether they be legally or illegally entered. Immigrants often travel with families, have educational and social service needs and are of concern to this study.

The key factors of interest here are the people who are mobile in nature in rural areas for the purpose of agriculture employment and who, because of factors unique to their life style have exhibited low educational attainment levels. Education programs sometimes use the term "five year migrants" (20) to refer to children of persons who have been migrants at some time during the previous five years. For the analysis of needs the focus of this study is on those presently mobile. In Chapters VI and VII when considering telecommunications applications a more general approach will be used to include present and previous migrants.

Income. Migratory farm workers are, almost by definition, poor. Like other statistical data about migrants income is difficult to establish precisely. This is understandable when considering migratory farm workers. Employment patterns defy demographers techniques of data collection. Each migrant often works for several employers, often as a crew member and, as of 1970, little or no information about a worker was available with then existing record systems on farm workers. Thus the workers themselves must be relied on for the information. However, most workers generally do not keep track of the places they have been employed or their earnings, for more than the previous few days.

Of the entire hired farm work force, that is not just migrants, only 19.5 percent, or one-fifth, did slightly over two-thirds of the total man-days of farm wagework. Conversely those workers who worked fewer than seventy-five days in agriculture comprised about 70 percent of the hired farm work force but only did about one-fifth of the man-days of work. (21)

Federal statistics show a 22.3 percent decrease in the number of workers working between seventy-five and 249 days at farmwork between 1966 and 1971. (22) Almost half of the farm labor force is composed of casual workers, or those who work less than twenty-five days per year in agriculture jobs. In 1971, one half million casual laborers averaged nine days of farm work. Workers who worked less than seventy-five days at farm wagework comprised 69.5 percent of the total but only did about one-fifth of the man-days of work. (23)

The Department of Agriculture reports that domestic migratory workers worked an average of 111 days in 1971 and earned 1,407 dollars for an average daily pay of 12.65 dollars. (24) Forty seven percent supplemented their farm income with nonfarm income. (25)

Health. Not only are certain diseases more prevalent but obtaining and paying for medical care is more difficult due to location, transportation problems, poverty and cultural biases. Local welfare agencies must often reimburse hospitals for medical care of migrants when federal programs do not apply. The yearly federal expenditure is about twelve dollars (26) per migrant for health care.

Digestive system diseases, respiratory disorders, and infectious and parasitic diseases are from two to five times as prevalent among migrants as they are in the general population. Tuberculosis is seventeen times as common. (27) According to a 1969 report, the life expentancy of the migrant is fifty-five years; for the Spanish-Heritage migrant it is thirty-eight. (28)

According to the National Sharecroppers Fund,

> "Farm work ranked third, behind only mining and construction, in total number of work related deaths in

> 1970. In addition to hazards arising from the proliferation of farm machinery, farm workers fare equal--and often greater--in dangers from chemical pesticides, which cause an estimated 75,000 acute poisonings annually." (29)

## Census, Streams, Groups, Movement

Total Number of Migrants. Federal government figures on the total number of migrants varies from department to department. This difficulty led a Senate Subcommittee on migratory farm labor to ask its staff in 1969 to contact all departments regarding a migrant census and try to ascertain what the total really was so as to end the confusion. The staff eventually reported that they could not come up with one reliable total figure. (30)

A member of the Economic Research Service, U.S. Department of Agriculture in a talk he gave in 1972, sums up one of the most quoted figures on the total number of domestic migrants when he said:

> "Analysis of information from the Department's Hired Farm Working Force series reveals that there are about 141,000 migratory farmworker households with an average of 4.82 persons per household or a total migratory population of 680,000. A total of 172,000 persons from these households did some migratory farm wage work in 1971." (31)

The Department of Labor released figures for the total migratory farm labor force of 178.0 thousand for 1971, that closely coincide with those from the Department of Agriculture. Table 33 shows the month by month totals by the Department of Labor for all types of seasonal hired farm labor, including migratory workers. The totals are generated from reports obtained from each state where the work is being performed. (32) Estimates by the Public Health Service, Department of Health, Education and Welfare on the total

### Table 33

### EMPLOYMENT OF SEASONAL AND MIGRANT HIRED AGRICULTURAL WORKERS, BY TYPE OF WORKER: 1971

Thousand of workers

| Type of worker | Employment | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| All types------- | 259.1 | 258.1 | 270.2 | 350.1 | 557.2 | 822.5 | 1010.5 | 870.3 | 746.9 | 629.0 | 371.6 | 277.5 |
| Total domestic--------- | 251.1 | 251.4 | 268.2 | 350.1 | 557.2 | 822.5 | 1010.5 | 870.2 | 744.0 | 623.4 | 366.1 | 268.9 |
| Local--------------- | 216.6 | 217.2 | 235.5 | 305.4 | 472.1 | 674.5 | 831.6 | 696.5 | 568.1 | 507.4 | 326.9 | 236.6 |
| Migrant*------------ | 34.5 | 34.2 | 32.7 | 44.7 | 85.2 | 148.1 | 178.9 | 173.6 | 175.9 | 116.0 | 39.1 | 32.4 |
| Intrastate------ | 13.0 | 13.1 | 13.5 | 20.4 | 30.7 | 44.3 | 62.0 | 60.1 | 54.5 | 37.7 | 17.4 | 17.0 |
| Interstate------ | 21.5 | 21.1 | 19.1 | 24.4 | 54.5 | 103.8 | 116.9 | 113.6 | 121.3 | 78.3 | 21.7 | 15.3 |
| Total foreign---------- | 8.0 | 6.7 | 2.0 | 0 | 0 | 0 | 0 | .1 | 2.9 | 5.7 | 5.5 | 8.6 |
| British West Indian- | 8.0 | 6.7 | 2.0 | 0 | 0 | 0 | 0 | .1 | 2.2 | 4.6 | 5.5 | 8.6 |
| Canadian----------- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 1.0 | 0 | 0 |

*Migrants include intrastate and interstate workers.

NOTE: Due to rounding, figures may not add to totals.
SOURCE: In-Season Farm Labor Reports of the Manpower Administration, Department of Labor.

number of migrants were at the 1 million level whereas the Office of Economic Opportunity estimated 350,000. (33)

There is a considerable amount of variation among estimates of the total number from various sources. The figures generated by the individual states, however are difficult to dispute, and many of them differ substantially from those of the federal government. For example Table 34 shows that Michigan had 18,500 migratory workers employed during 1971 according to federal statistics. The state of Michigan however censused 43,400 interstate migrants in 1970. (35) Similarly, Texas was credited with 17,900 migrants in 1971 by the federal government while Texas reported 45,195 interstate migrants. (36)

The exact number of migratory farm workers will probably never be known. The lower limit figure for the total is the U.S. Department of Agriculture figure of 172,000 or 680,000 if family members are included. (37) The upper limit is probably about 1 million, including family members, judging from sources studied.

Figure 4 shows, graphically, the totals represented by category by month, of hired farm workers in 1960. Comparison with figures for the hired farm working force of 1971 indicate little significant difference except an overall decline in total numbers. Due to large uncounted numbers of illegal immigrants from Mexico, it is not possible to make a careful comparison with the 1960 totals. It is possible that the total number of foreigners (if illegal immigrants are counted as foreigners) has not decreased drastically (over 25 percent) since 1964, despite legislative changes. Figure 4

## Table 34

## PEAK EMPLOYMENT AND PERIOD OF EMPLOYMENT OF DOMESTIC MIGRATORY WORKERS* IN AGRICULTURE, STATES WHICH USED MIGRATORY WORKERS: 1971

| State | Peak number of migrants employed | Periods in which migrants were employed | Date of peak employment |
|---|---|---|---|
| California | 62,500 | Jan. - Dec. | Sept. |
| Michigan | 18,500 | Apr. - Nov. | June |
| Texas | 17,900 | Jan. - Dec. | July |
| Florida | 17,400 | Jan. - Dec. | Jan. |
| Ohio | 15,800 | May - Oct. | Sept. |
| Washington | 15,700 | Jan. - Dec. | Oct. |
| Oregon | 12,300 | Jan. - Dec. | July |
| New York | 11,400 | May - Nov. | Oct. |
| New Jersey | 10,400 | Apr. - Nov. | Aug. |
| North Carolina | 9,100 | Jan. - Dec. | July |
| Indiana | 7,200 | Apr. - Oct. | Sept. |
| Idaho | 6,500 | Mar. - Nov. | June |
| Montana | 5,900 | Jan. - Dec. | Aug. |
| Colorado | 5,600 | Apr. - Nov. | June |
| Virginia | 5,100 | May - Nov. | July |
| Pennsylvania | 4,600 | Jan. - Dec. | Sept. |
| Arizona | 4,100 | Jan. - Dec. | Jan. |
| Illinois | 4,100 | May - Oct. | June |
| Oklahoma | 4,000 | Jan. - Dec. | June |
| South Carolina | 4,000 | June - Oct. | July |
| North Dakota | 3,900 | Apr. - Oct. | Aug. |
| Minnesota | 3,600 | May - Nov. | July |
| Kansas | 3,200 | Apr. - Nov. | Aug. |
| Connecticut | 2,900 | Jan. - Nov. | July |
| Wisconsin | 2,700 | May - Oct. | Aug. |
| Wyoming | 2,300 | May - Aug. | June |

Table 34 (continued)

## PEAK EMPLOYMENT AND PERIOD OF EMPLOYMENT OF DOMESTIC MIGRATORY WORKERS* IN AGRICULTURE, STATES WHICH USED MIGRATORY WORKERS: 1971

| State | Peak number of migrants employed | Periods in which migrants were employed | Date of peak employment |
|---|---|---|---|
| Nebraska | 2,200 | June - Aug. | June |
| Delaware | 2,000 | May - Nov. | Aug. |
| Maryland | 1,900 | May - Oct. | Aug. |
| Utah | 1,600 | May - Nov. | July |
| Massachusetts | 1,500 | Jan. - Dec. | Aug. |
| New Mexico | 1,300 | Mar. - Nov. | June |
| Arkansas | 700 | May - Aug. | May |
| Alabama | 600 | May - Nov. | July |
| Louisiana | 500 | Mar. - Dec. | Apr. |
| West Virginia | 500 | Sept.- Nov. | Oct. |
| Iowa | 300 | May - Nov. | Aug. |
| Kentucky | 300 | June - Nov. | July |
| Maine | 200 | Aug. | Aug. |
| Tennessee | 200 | May - Oct. | July |
| Missouri | 100 | July - Oct. | Sept. |
| Vermont | 70 | Sept. - Oct. | Oct. |
| New Hampshire | 40 | June - Oct. | Aug. |

*Migrants include intrastate and interstate workers.

Source: In-Season Farm Labor Reports of the Manpower Administration, U.S. Dept. of Labor.

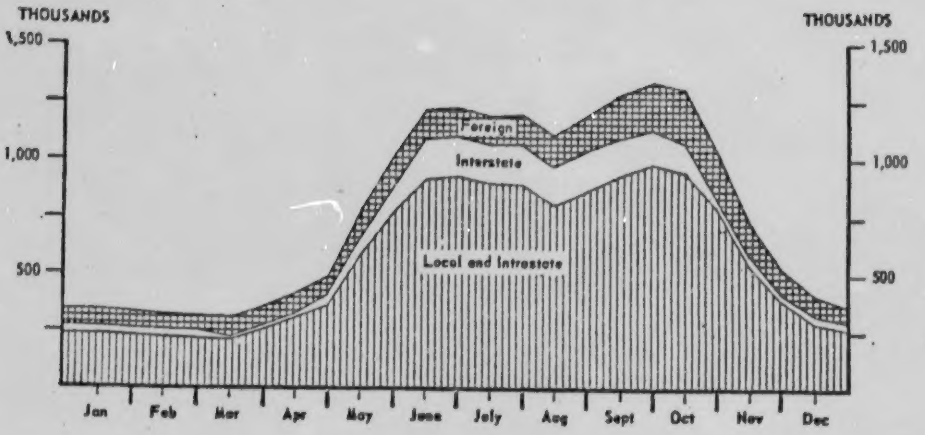


Figure 4

Seasonal Hired Farm Employment: 1960

Source: U.S. Dept. of Agriculture provided to 1969 Senate Subcommittee Hearings on "Seasonal Farmworker Powerlessness" also illustrate the relative distribution of local, intrastate, interstate and foreign laborers that compose the seasonal hired farm working force.

A state by state breakdown of total migrants employed and the months of the peak seasons are given in Table 34. The total figures given may be inaccurate but the relative size comparisons between states and the seasonal periods are relevant. As migrants work most intensely in relation to seasonal and crop schedules it is instructive to observe the labor needs by crop type in the United States as given in Table 35.

From Mexico, according to McElroy of the U.S. Department of Agriculture, "The number of foreign nationals legally entering the United States for employment in agriculture declined from 334,729 in 1960 to 17,474 in 1970." (38) Legal immigrants increased from 32,967 in 1964 to 70,071 in 1972. (39)* Since the termination of the Bracero Program at the end of 1964 the number of illegal entrants apprehended from Mexico has increased ten fold from 43,844 in 1964 to 430,213 in 1972. (40) Because they are neither aliens nor citizens, illegal entrants work for extremely low wages and will tolerate poor working conditions under fear of being caught if they complain. The number working in agriculture is not known.

Migratory farm workers are employed at some time during the year in about 30 percent of the rural counties in the United States.

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*In a recent (1974) Supreme Court decision involving cases Saxbe v. Bustos and Cardona v. Saxbe, the Court ruled that "commuters" from Mexico, a specific status granted by the Immigration and Naturalization Service, are considered immigrants lawfully admitted for permanent residence. (41)

### Table 35

### PEAK SEASONAL EMPLOYMENT, BY
### MAJOR CROP: 1971*

| Crop | Peak seasonal employment 1971 | |
|---|---|---|
| | Number of workers+ | Date |
| Strawberries | 75,000 | June |
| Apples | 74,200 | October |
| Corn | 71,300 | July |
| Tomatoes | 68,800 | September |
| Grapes | 56,000 | September |
| Citrus fruits | 48,300 | February |
| Bushberries | 46,900 | July |
| Beans | 44,000 | August |
| Potatoes | 43,400 | October |
| Sugar beets | 36,200 | June |
| Peaches | 34,200 | August |
| Cherries | 32,600 | July |

*Crops listed are those in which 30,000 or more seasonal hired workers were employed at peak.

+Employment in all activities including planting, cultivating, and harvesting.

Source: In-Season Farm Labor Reports of the Manpower Administration, U.S. Department of Labor.

In 1965 the U.S. Department Labor and the U.S. Department of Health, Education, and Welfare compiled figures indicating there were 668 counties in which 100 or more migrants were employed. (42) There were 2174 counties designated as rural in 1970. (43)

Due to geographic and climatic factors there are different growing seasons within the United States; basically one season in the northern states and two or three in the southern states. Seasonal needs for farm workers are roughly May to October in the north and all year in the southern states with a concentration of need from August to March.

Figures 5 through 8 show by season the 668 counties where more than 100 migratory farm workers are employed. The figures show the overall pattern of shifting of persons from season to season but not the pattern of movement. Figure 9 shows the yearly peak in each state to give a sense of numbers. Figure 5 and 7 show spring and fall seasons and indicate the areas where migrant children may be located with their families during the school season, as well as in the winter. The winter, or "home base" location of migrants is depicted in Figure 8.

Movement Patterns. The only consistent factor about migratory farm workers in relation to movement is inconsistency. Individual migrant movements are unpredictable and inconsistent in destination, direction, timing, volume or grouping. On the macro level it is generally accepted that there are supply states in the southernmost states from which migrants go north during the spring and to which they return in the winter months.

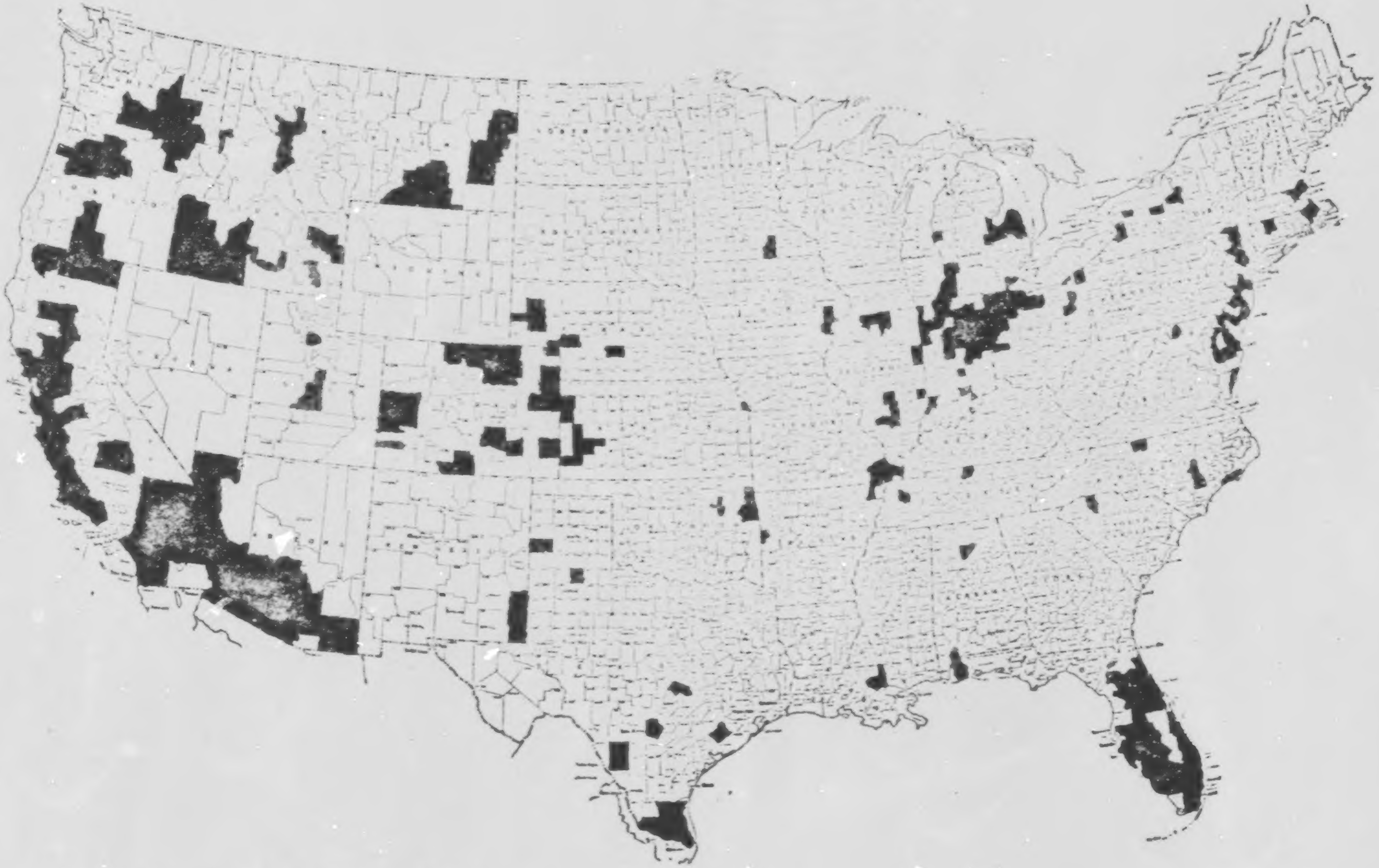

Figure 5: SEASONAL MAP SHOWING COUNTIES WITH OVER 100 MIGRATORY FARM WORKERS*
Season: Spring

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*Plotted from data from: U.S. Dept. of Health, Education, and Welfare, Public Health Service, Publication No. 540, 1966 and U.S. Dept. of Labor, Farm Labor Service, 1966.

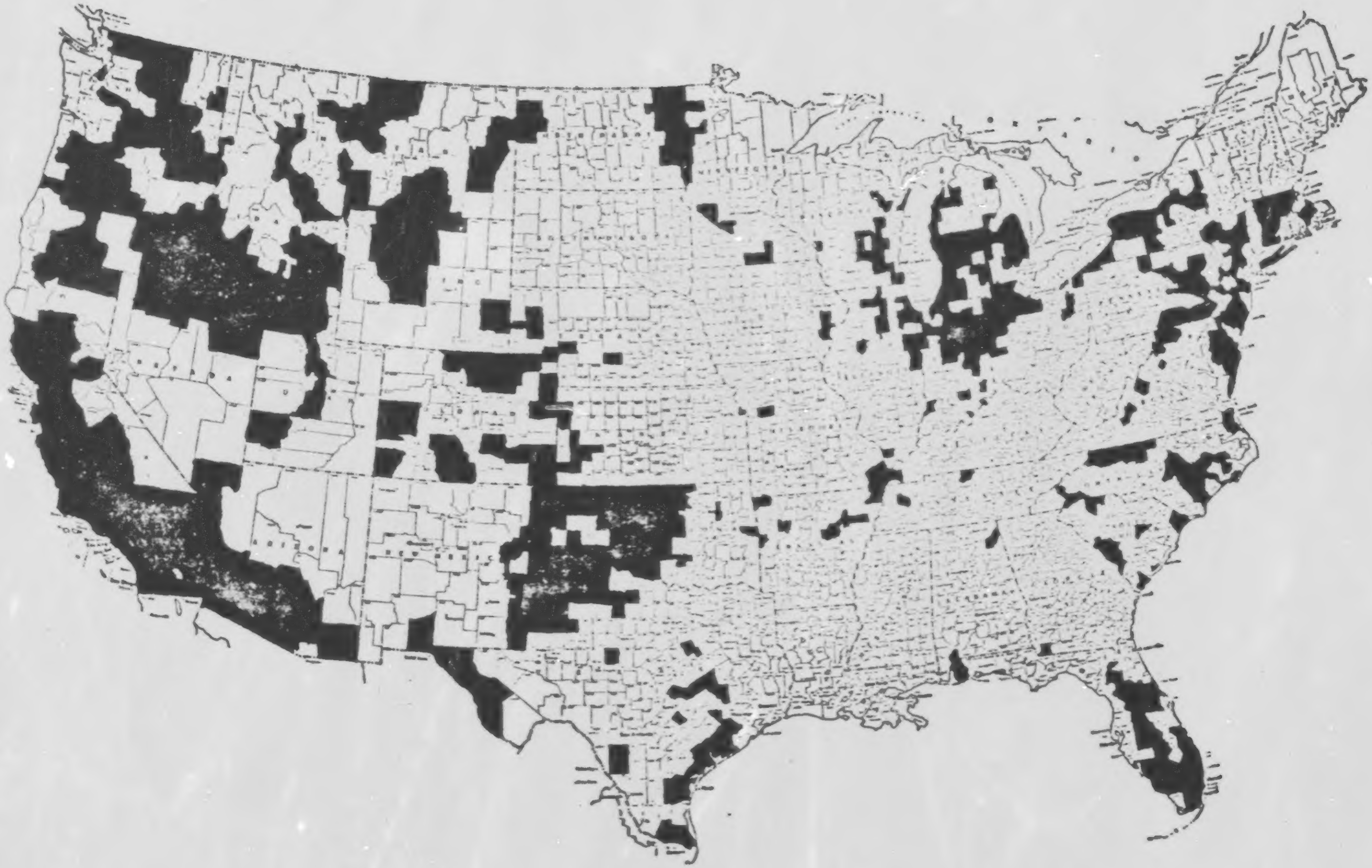

Figure 6: SEASONAL MAP SHOWING COUNTIES WITH OVER 100 MIGRATORY FARM WORKERS*
Season: Summer

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*Plotted from data from: U.S. Dept. of Health, Education, and Welfare, Public Health Service, Publication No. 540, 1966 and U.S. Dept. of Labor, Farm Labor Service, 1966.

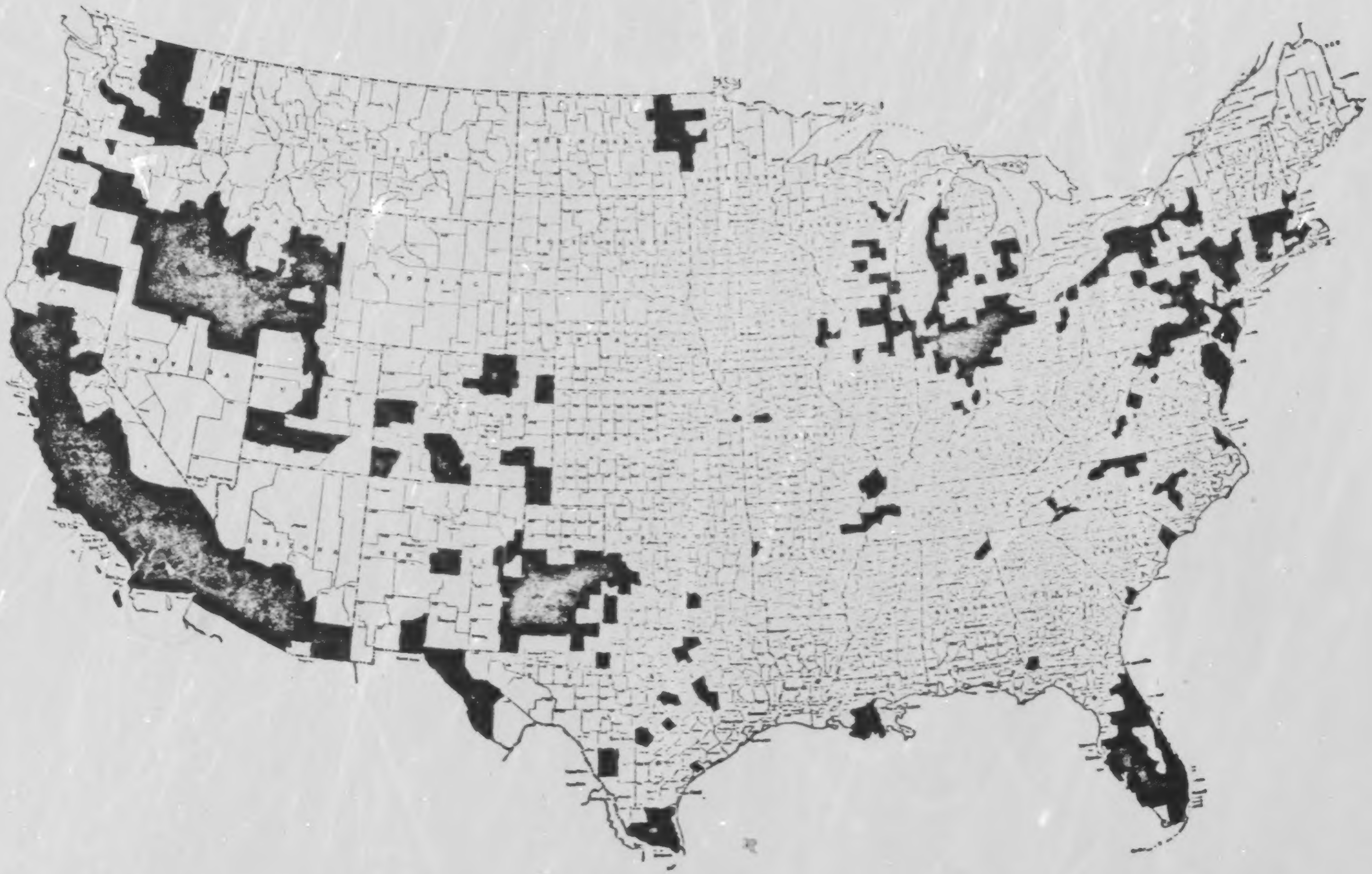

Figure 7: SEASONAL MAP SHOWING COUNTIES WITH OVER 100 MIGRATORY FARM WORKERS*
Season: Fall

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*Plotted from data from: U.S. Dept. of Health, Education, and Welfare, Public Health Service, Publication No. 540, 1966 and U.S. Dept. of Labor, Farm Labor Service, 1966.

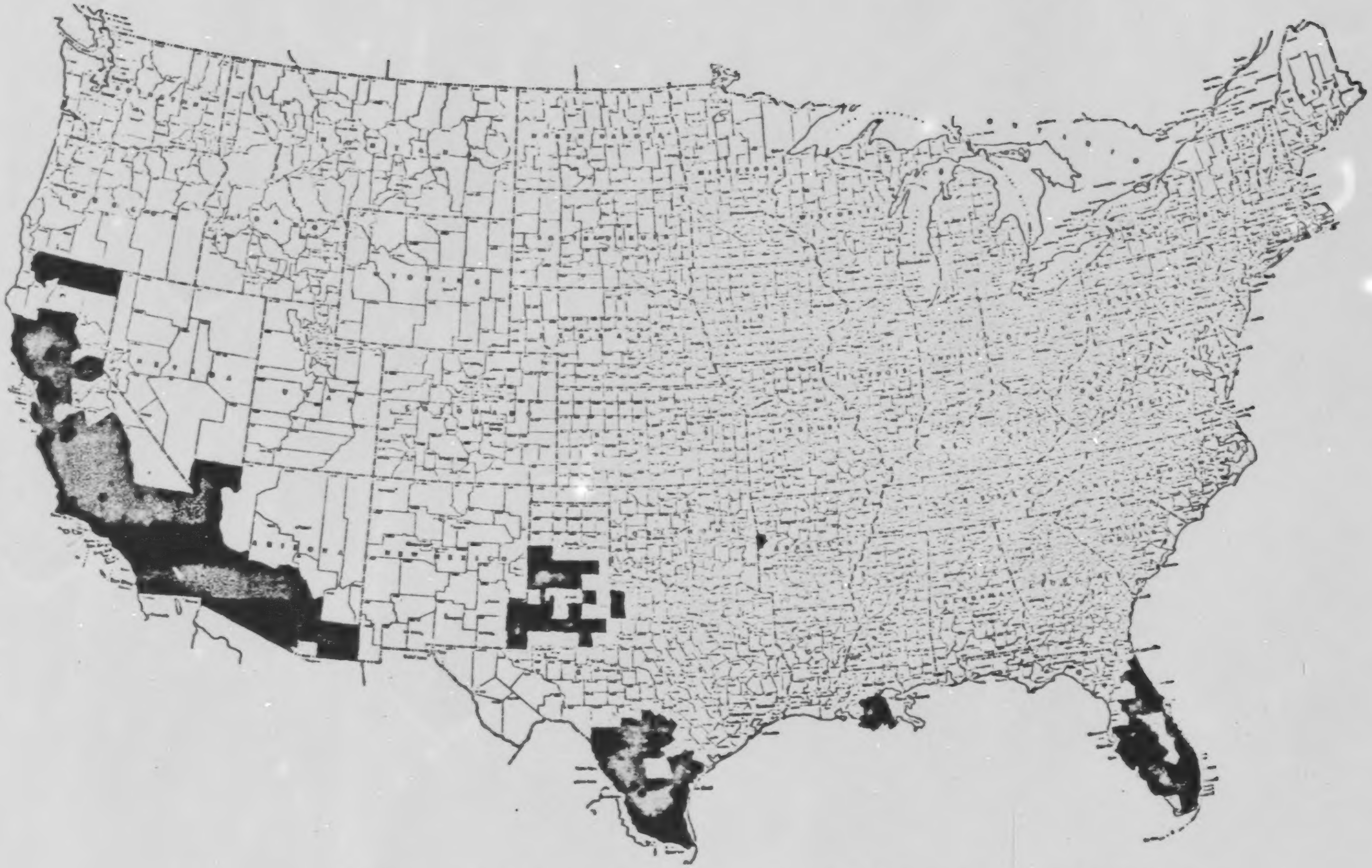

Figure 8: SEASONAL MAP SHOWING COUNTIES WITH OVER 100 MIGRATORY FARM WORKERS
Season: Winter

---

Plotted from data from: U.S. Dept. of Health, Education, and Welfare, Public Health Service Publication No. 540, 1966 and U.S. Dept. of Labor, Farm Labor Service, 1966.

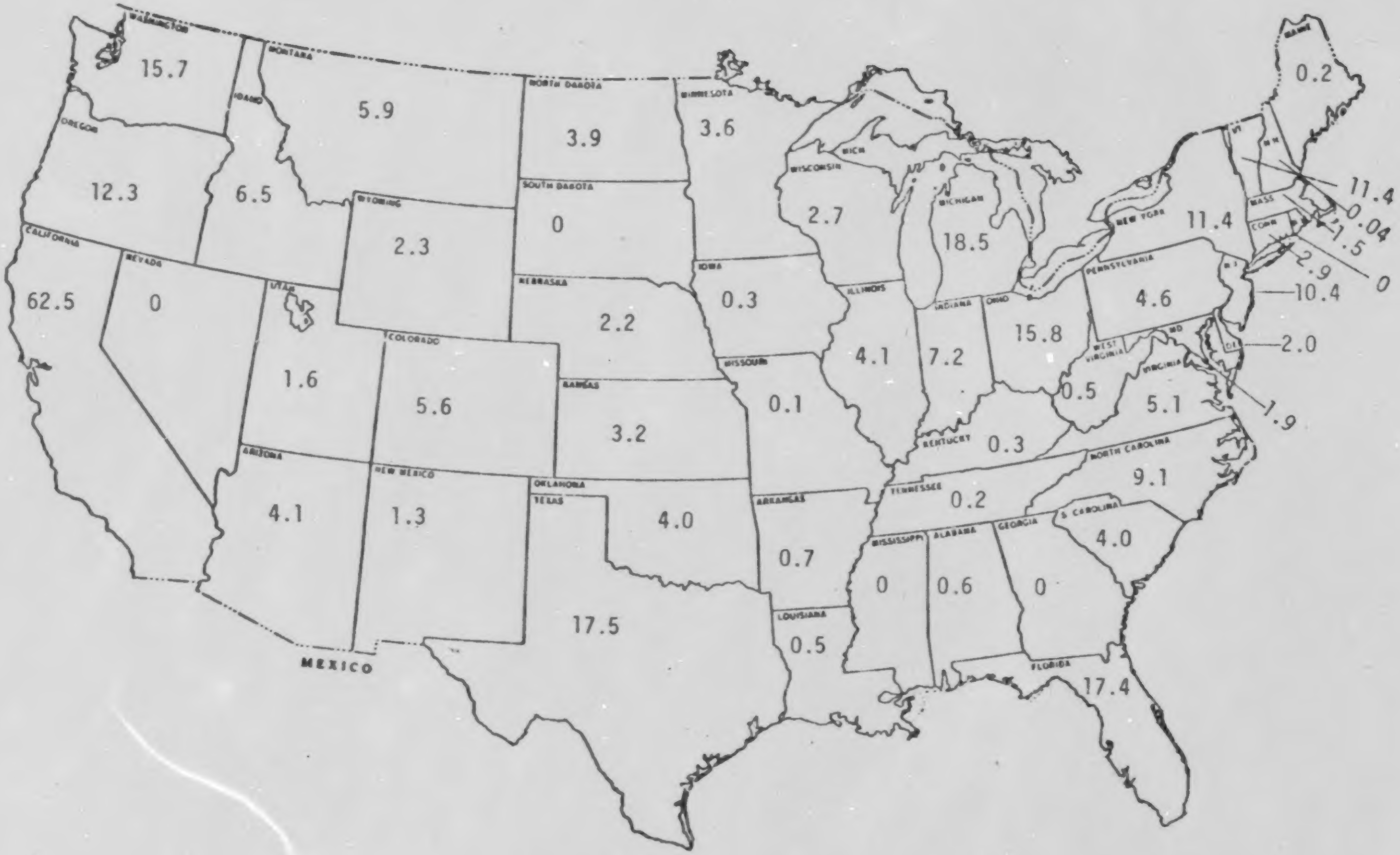
WASHINGTON 15.7
OREGON 12.3
CALIFORNIA 62.5
IDAHO 6.5
NEVADA 0
MONTANA 5.9
WYOMING 2.3
UTAH 1.6
ARIZONA 4.1
COLORADO 5.6
NEW MEXICO 1.3
NORTH DAKOTA 3.9
SOUTH DAKOTA 0
NEBRASKA 2.2
KANSAS 3.2
OKLAHOMA 4.0
TEXAS 17.5
MINNESOTA 3.6
IOWA 0.3
MISSOURI 0.1
ARKANSAS 0.7
LOUISIANA 0.5
WISCONSIN 2.7
MICH
MICHIGAN 18.5
ILLINOIS 4.1
INDIANA 7.2
OHIO 15.8
KENTUCKY 0.3
TENNESSEE 0.2
MISSISSIPPI 0
ALABAMA 0.6
GEORGIA 0
FLORIDA 17.4
S CAROLINA 4.0
NORTH CAROLINA 9.1
VIRGINIA 5.1
WEST VIRGINIA 0.5
PENNSYLVANIA 4.6
NEW YORK 11.4
MD
DEL
N J
MAINE 0.2
VT
N H
MASS
CONN
R I
11.4
0.04
1.5
0
2.9
10.4
2.0
1.9
MEXICO

Figure 9: PEAK EMPLOYMENT OF DOMESTIC MIGRANT FARMWORKERS BY STATE, 1971
In Thousands

Source: In-Season Farm Labor Reports of the Manpower Administration, U.S. Dept. of Labor.

Migrants move not only with the sun, but also in patterns that have led to the delineation of the movements into "streams." (See Figure 10) The "source" or starting point of these streams is basically the southernmost states of California, Texas and Florida. The Eastern Stream migrants migrate basically along the coastal states of the east, the other coast for the Western Stream, and the Central area is covered, in large part, by the stream from Texas. A 1963 Social Security bulletin assumes 350,000 to 400,000 workers and breaks the total down into "streams" of 250,000 for the Texas stream, 100,000 for the Western/Pacific stream, and 100,000 for the Eastern stream. (44)

Rapton found that fifty-one percent of migrants travel less than 75 miles while thirty-one percent travel over 500 miles and twenty percent travel 1,000 miles or more. (45) The percentage of migrants that travel the full length of one of the "stream" routes is smaller than the percentage that travel instate or perhaps only to a neighboring state.

A good example of the movement patterns on a smaller scale is given graphically in Figure 11. The Texas movement patterns given are typical of other winter areas such as California and Florida, where departures are from several in-state locations, and movement occurs within the state (intrastate migration).

Some examples serve to tell the story of movements in the "streams." Following closely the pattern indicated by the map of the "streams," those who were considered migrants in the State of Washington during 1966 lived in the winter in the following states: (46)

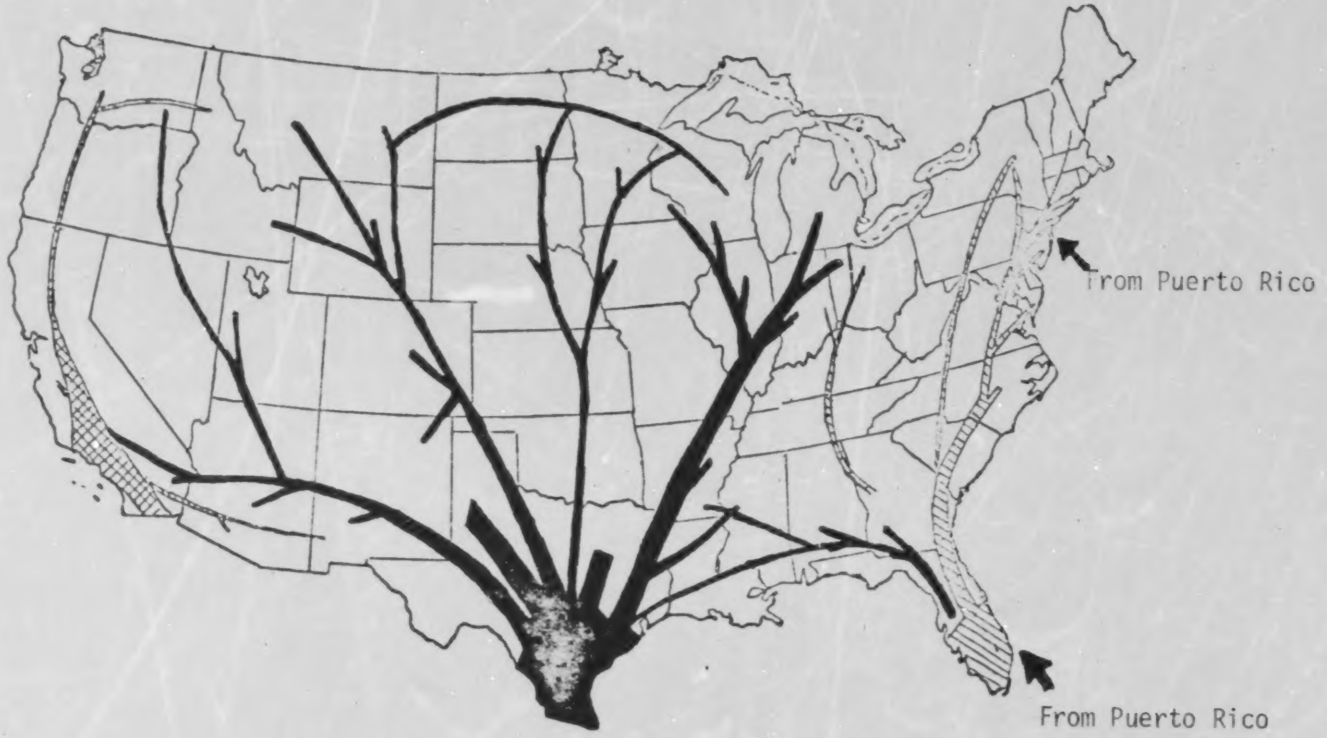
From Puerto Rico
From Puerto Rico

Figure 10

TRAVEL PATTERNS OF SEASONAL MIGRATORY AGRICULTURAL WORKERS*

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*Source: U.S. Dept. of Health, Education, and Welfare, Public Health Service, Publication No. 540, 1966.

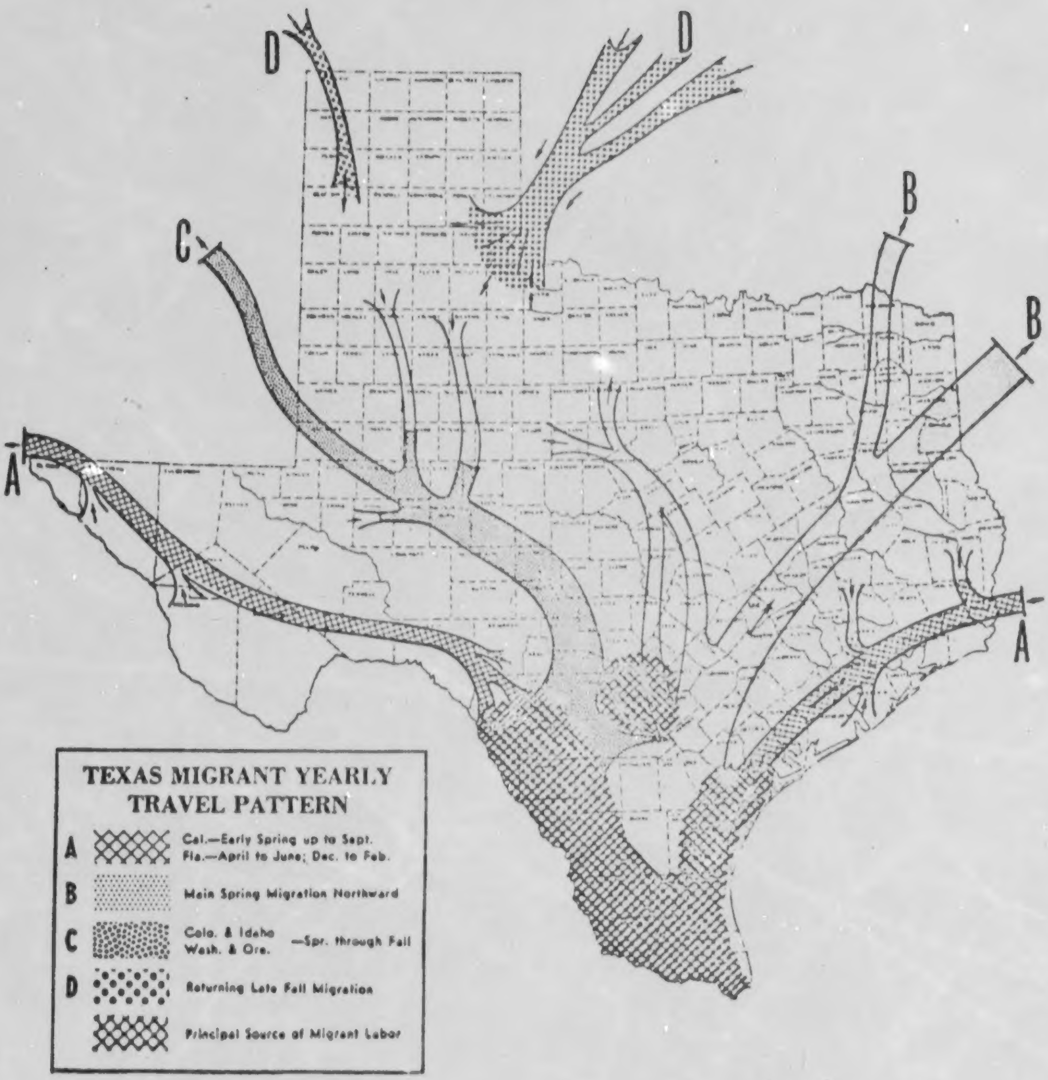

D
D
C
B
B
A
A
TEXAS MIGRANT YEARLY TRAVEL PATTERN
A Cal.—Early Spring up to Sept. Fla.—April to June; Dec. to Feb.
B Main Spring Migration Northward
C Colo. & Idaho Wash. & Ore. —Spr. through Fall
D Returning Late Fall Migration
Principal Source of Migrant Labor

Figure 11

TEXAS MIGRANT YEARLY TRAVEL PATTERNS: 1970*

---

*Source: Texas Good Neighbor Commission.

| | |
|---|---|
| Washington | 28.1 percent |
| California | 26.5 percent |
| Other | 17.8 percent |
| Texas | 14.4 percent |
| Oregon | 7.6 percent |
| Arizona | 5.6 percent |

A more interesting and varied example is a state mid-stream; Delaware. In the summer of 1967 there were sixty-two crews under study; of these crews, fifty-three were from Florida, five from Texas and on each from North Carolina, South Carolina, Virginia and Alabama. (47) The crews from Florida did not all come directly. One crew had three stops, two crews had two stops enroute and twenty four crews had one stop while twenty-six came directly. After finishing in Delaware, thirty-one crews were scheduled in other states and the destinations are diverse. Three crews were scheduled to go to New England (Vermont and New Hampshire), six crews were scheduled to go south (Virginia and North Carolina) while seventeen crews were planning to go to the Northeast (New York and Pennsylvania) and four crews were planning to go to states west of Delaware (West Virginia, Illinois and Michigan). (48)

Crew Size. Many migratory farm workers travel in crews, often headed by a crew leader. Crew leaders contract with the growers for harvest and sometimes processing work. The crew leader engages, transports, supervises, and pays the laborers. Crews are often extended family units. Many factors influence a crew's size including the type and size of transportation, size of member families, type of crew inter-relationships, needs of the employers and the size limitations of management of this type. Many crews often work at one job location.

A study in Delaware found the size of sixty-two crews to vary from six to fifty-five workers with a third of them in the sixteen to twenty-five member range. Two thirds of the crews also had from one to thirty-five non-working members; fifty-six crews were composed of Blacks and six of Mexican-Americans. (49) A study in Texas in 1969 found 147,000 migrant individuals worked in ten thousand groups thus averaging about fifteen members per group. (50) Another Texas study was undertaken of groups leaving and on return to Texas. This study showed that 65 percent of the groups were composed of ten members or less. The age mix was found to be 40 percent children under sixteen years of age and 60 percent adults, with an almost even split between males and females. (51)

Family Size. Family size of migrant families averaged 4.82 persons per household in 1971 on a nationwide basis according to the Department of Agriculture. (52) A report from Texas gave a family size of 7.4 in 1969 (53) and another study on the East coast found an average of 4.74. (54)

Age. The age distribution of migratory farm workers is skewed towards youth. In 1965, 53 percent were aged twenty-five or less while only 10 percent were over fifty-four years old. (55) Fifty-eight percent of the hired farm working force were not in the labor force most of the year because they were primarily housewives and students. (56)

## Employer Configuration, Recent Labor Needs, Entrepreneurship Patterns, Future Outlook

The introduction of mechanized technology to agriculture has produced a profound effect on the productivity of farmers and farm workers. In 1910 each farm worker produced food and fibre for seven persons but by 1960 each one produced food and fibre for twenty-four persons. (57) Migratory farm labor is employed predominantly in the harvesting of fruits and vegetables, many of which cannot yet be mechanically harvested, or harvested only under certain conditions. Table 36 shows the percentage of vegetables which were being machine harvested in 1968. Fruits are almost entirely hand picked, due to several factors as shown in the following:

> "Technology in vegetable harvesting moves forward much faster than with fruits due in part to inherent differences in the crop producing agent (bushes, ground vines and tubers as compared to trees, etc.) and the fact that volumewise and valuewise vegetables are far more important to the consumer and the agri-economy than fruits and nuts." (58)

It is clear that the direction in agriculture is towards further mechanization. An article about the study Hard Tomatoes, Hard Times indicates that agriculture research is committed to the technological and managerial needs of large scale producers and corporations. (59) If technical or managerial changes are not sufficient then altering plants to conform to mechanized production is undertaken as expressed in the following excerpt. (60)

> "It is believed that greater production and profits can be gained through continued refinements and where technical difficulties prevent further mechanical advances, attention has been turned to making crops more suitable for the machines. New varieties of fruit and vegetables are being sought which will permit a greater portion to be harvested at the same time...Chemicals are being developed which will control disease, add nutrients, and control growth. Mechanical devices are replacing human labor."

## TABLE 36

## PERCENTAGE OF VEGETABLES, FRUITS AND NUTS MACHINE HARVESTED IN 1968

| Vegetable | Percent of Total Crop |
|---|---|
| All Vegetables | 56 |
| Fresh | 52 |
| Process | 73 |
| Tomatoes | 44 |
| Fresh | 0 |
| Process | 65 |
| Sweet Corn | 78 |
| Fresh | 30 |
| Process | 100 |
| Snap Beans | 79 |
| Fresh | 30 |
| Process | 100 |
| Potatoes | 85 |
| Lettuce | 0 |
| Onions | 35 |
| Cabbage | 1 |
| Carrots | 95 |
| Cucumbers | 8 |
| Peas | 99 |
| Sweet Potatoes | 70 |
| All Fruits and Nuts | 2 |

Source: Texas Good Neighbor Commission, Texas Migrant Labor, Annual Report 1970, Austin, Texas

While awaiting the arrival of new machinery, plant varieties and chemicals, the agri-business growers are using social mechanisms to provide labor to fit their needs. The economics of the grower's business requires labor in large numbers for a short period of time that is adaptable to the task at the cheapest possible price. Since the general labor market is not conducive to these demands, techniques have been used to obtain labor, keep it for the time necessary and dispose of it until the following season. (61)

One technique of growers has been to perpetuate a surplus labor market. Surplus labor is labor that is available at or below subsistance wages. Foreign labor in quantity when added to the domestic market, produces a surplus labor market condition where people will work for low wages. With changes in immigration laws controlling the number of immigrants and higher minimum wage laws, many growers are switching crops or obtaining machines to harvest crops. In crops that are not conducive to mechanization and still require labor, it is becoming feasible for unionization efforts to succeed due to a decline in surplus labor. Cesar Chavez has been leading the latest efforts at unionization of farm workers in California and has obtained some contracts with growers. (62)

Decline in Need. The consensus from all sources regarding the increased use of machinery in agriculture is a net decline in the need for farm workers in the future, especially migratory farm workers employed in harvesting. There are varying predictions as to the magnitude of the coming declines. One source estimated a 20 percent drop in labor demand by 1976 due to mechanization. (63)

Another source noted a 3 to 4 percent annual decrease in jobs and numbers of migrants from 1965 to 1970, and a 10 percent decrease in job opportunities and 7 percent decrease in the number of migrants in 1970. (64) That a decrease is inevitable but that the rate of displacement will be slow is verified by McElroy of the Department of Agriculture. (65)

> "Typically, labor-saving innovations in agricultural production tend to eliminate farm jobs gradually. The many engineering, horticultural, and other technical problems involved in developing economically feasible mechanical harvesters for fresh market fruit and vegetable crops -- which have resisted mechanization thus far, and so continue to be major employers of migrants -- appear sufficiently formidable, with current research and development efforts, to assure a residue of stoop and hand labor jobs for the foreseeable future."

Table 37 gives a historical view of the total number of working migrants provided by the U.S. Department of Agriculture. The table shows a slow decline over 20 years and a rather increased rate of decline beginning in 1967.

Employers of Migratory Farm Workers. To the casual observer, farm workers are employed a few at a time by small family run farm so that any government regulation changes would involve perhaps millions of farmers and thus be unmanageable and unenforceable. The facts do not support this popular belief.

In 1969 there were 2.7 million farms in the United States covering an area of 1.06 billion acres. (66) The majority of migrants are hired predominantly by the farms that pay more than one thousand dollars annually in wages and those farms that hire farm labor for less than 150 days. Only 35 percent of all farms hire labor for less than 150 days and only 10 percent of all farms, or 291 thousand

## TABLE 37

## U.S. DEPARTMENT OF AGRICULTURE CENSUS OF FARM WORKERS AND DOMESTIC MIGRATORY FARM WORKERS: 1949 - 1971

| Year | All Farm Wageworkers | Migrants |
|---|---|---|
| 1949 | 4,140.000 | 422,000 |
| 1952 | 2,980,000 | 352,000 |
| 1954 | 3,000,000 | 365,000 |
| 1956 | 3,575,000 | 427,000 |
| 1957 | 3.962,000 | 427,000 |
| 1959 | 3,577,000 | 477,000 |
| 1960 | 3,693.000 | 409,000 |
| 1961 | 3,448,000 | 295,000 |
| 1962 | 3,622,000 | 380,000 |
| 1963 | 3.597,000 | 386,000 |
| 1964 | 3,370,000 | 286,000 |
| 1965 | 3,128,000 | 466,000 |
| 1966 | 2,763,000 | 351,000 |
| 1967 | 3,078,000 | 276,000 |
| 1968 | 2.919,000 | 279,000 |
| 1969 | 2,571,000 | 257,000 |
| 1970 | 2,488,000 | 196,000 |
| 1971 | 2.550,000 | 172,000 |

Source: U.S. Department of Agriculture, Hired Farm Working Force, 1971.

farms, pay more than 1000 dollars per year in wages (67). "More than 60 percent of the hired farm labor force is employed on less than 3 percent of all farms." (68) Figure 12 includes graphs that show the small percentage of farms that are the prime employers of migrants.

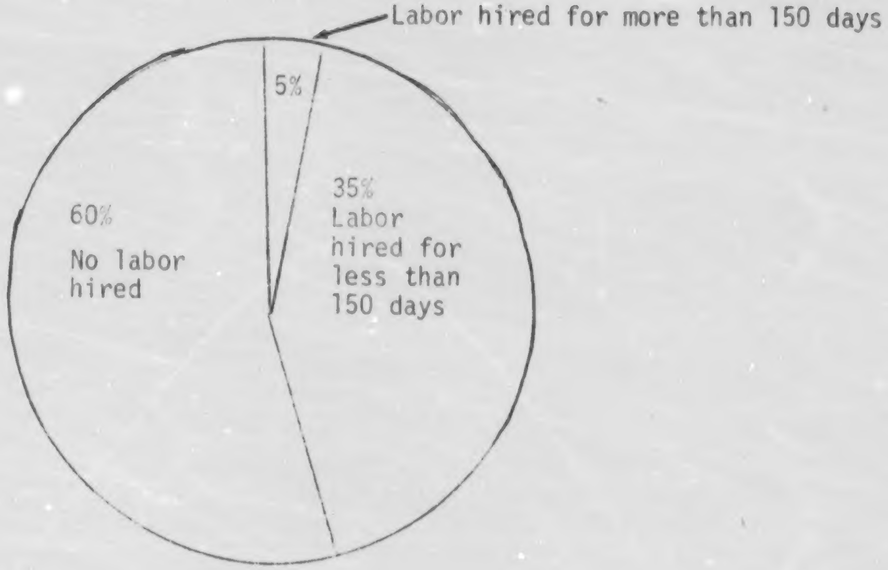
Many family farms become the property of large corporations and many farmers contract with corporations for the harvest of the crop. This method of selling the crop often before it is planted has resulted in a situation where "farmers producing under contract transfer a considerable part of many entrepreneurial functions to off farm firms and government agencies." It is now common to see firms involved in growing, processing and marketing of foods. This vertical integration has produced drastic changes for farmers.

Testimony at Senate hearings gives some evidence of the extent to which corporations have become involved in agriculture. (70)

> "In 14 states with 1967 farm marketings totaling $11.5 billion (28% of total U.S. marketings) less than 50% of these marketings came from family farms. In 1969 over 34% of the hired farm work force were employed in the four states of Arizona, Florida, California and Texas where corporate farming has made its greatest impact. Family farm sales in these states were: Arizona, 11%, Florida, 20%; California, 21%; Texas 48%."

Where previously farm workers were employed by many families they are now hired by fewer, larger more economically powerful firms. The vertical integration and other management changes in agriculture have not changed the employment conditions of migratory farm workers. The new agri-businesses have continued to capitalize on cheap labor for their profits.

What emerges is a pattern where the number of hired farm workers from year to year is steadily decreasing, mainly due to



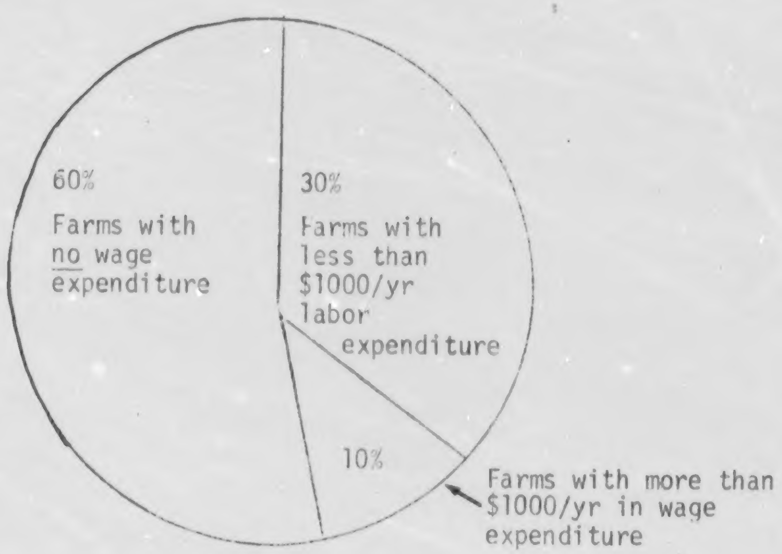


Figure 12

GRAPHS SHOWING PERCENTAGE OF FARMS HIRING LABOR IN CATEGORIES OF TIME AND MONEY: 1969

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Source: 1969 Census of Agriculture in the U.S.

changes to the use of technology that replaces human labor and to new technology/manpower mixes. The number of migratory farm workers swells and decreases seasonally during each year and has experienced an overall decrease over the past decade, with indications of further decline. The employers of farm workers are becoming fewer and fewer and are changing from small family farms to large operations, often vertically integrated corporations run by managers, not the owners. Although the number of migrant workers has also declined, there is little sign that migration for the purpose of performing farm labor will soon end.

The Future Outlook for Migrants. In discussing the future of migrants with respect to education or other factors, it is important to note their special status with respect to most citizens. Because of yearly mobility, many migrants do not fulfill local or state residence requirements. This often disqualifies migrants from obtaining welfare services and from voting.

Employment practices are such that Social Security deductions are seldom paid in migrants names, although they are often withheld. Income tax deductions are seldom made. Farm workers are excluded from the protections of the National Labor Relations Act and the Fair Labor Standards Act. (71) Organizing by farm workers for the purposes of unionization is thus difficult as they do not enjoy the protection of labor laws as do persons in other economic activities. In addition most states exclude farm workers from unemployment compensation.

A migrant thus has no union representation, no voice in the election of school or government officials, or no benefits of Social Security for retirement. With a very low income a migrant has little access to health services, private housing, quality food, and communications media. The decisions a migrant is left to make are few and the recourse for change or complaint are few. Their economic, social and political power is very small.

The future for persons and families now working as migratory farm workers is unclear as there are forces at work which can change the future profile and life style of farm workers. The change in immigration laws has restricted somewhat the foreign labor supply for farm work, the mass migrations from rural areas has slowed, and surplus labor is basically becoming a thing of the past due to relatively stable low unemployment levels. Unionization of farm workers is becoming more feasible, although at the end of 1974 it is unclear whether Cesar Chavez and the United Farm Workers or the Teamsters will represent farm workers, or the extent to which unionization will take hold. (72)

The future from the point of view of the Department of Agriculture in 1971 was:

> Aside from advances in technology, there is nothing else visible that will cause migrants to discontinue following the crops. To the contrary, unless stringent restrictions are placed on employers in an effort to eliminate family migrancy, most migrant families will continue their annual treks out of economic necessity, and the ensuing mobility will continue to reinforce their poverty status.
>
> Unfortunately, too many of the past efforts on behalf of migrants, by both the Legislative and Executive branches of government at all levels have been ineffective programs largely uncoordinated and of questionable value to migrants. (73)

The direction indicated by the federal government in relation to migrancy is to help bring it to a gradual end. Funding in education is to help migrants get a better education to participate in the greater society. A 10 million dollar a year program in 1972 funded by the Department of Labor to help migrants settle out through relocation, training and job placement indicates a policy of adjustment out of migrancy. (74)

## Educational Attainment of Migrants, Present Education Programs and Funding of Migrant Education

Introduction and Definition. Education for migrants can be defined to include the education of children, health education, language education, general and adult education, vocational education for employment and even education designed for assimilation into mainstream society. Most education programs for migrants are centered on the education of migrant children and this will be the major focus here.

In a very real sense migrants, as a subculture, educate their young in ways necessary to survive within the confines of their existence. Many observers of migrants discovered that migrants exist in a world that is almost void of the need to read or write. Instead rules of survival are developed with values and attitudes that complement these indigenous rules (75, 76). Migrant adults have developed their own form of speech, described in Goodwin as: (77)

> ...a linguistic code which is suited to maintaining social relationships, but which is unsuited for sharing familiar experiences and opinions, for analysis and

> careful reasoning, for dealing with anything hypothetical and beyond the present, or for dealing with anything complex.

It is generally recognized by migrants, educators, critics, concerned citizens and employers that the formal education levels obtained by most migrants is inadequate for most employment positions outisde of farm labor, and insufficient preparation to deal with urban life. Migrants are regarded by many as the "disadvantaged of the disadvantaged." Basically migrants seem to be deficient in comprehension of subject material in all courses or subjects normally taught in school. In addition, special problems of language, interpersonal relations, motivation and self concepts are commonly found.

Educational Attainment Levels of Migrants. It is well recognized that migratory farm workers have one of the lowest educational attainment levels of any group in the United States. According to a 1969 report, the national median of years completed in school by the average farm worker is 8.6 and over 17 percent of the farm labor force is functionally illiterate. (78) A detailed 1969 study of migrants undertaken in Delaware revealed only 8 percent high school graduates with 10 percent completing the fifth grade or less. (79) A 1970 Texas study indicated two thirds of adult migrants are functional illiterates among those surveyed. (80)

In 1967 the U.S. Department of Agriculture published a study by Avra Rapton about migrant personal and economic characteristics. The study showed that migrants had an average educational attainment of 8.5 years. (81) Many persons who are presently working as migrants may not have been members of migrant families when they attended school. Many may have become farmworkers because of lack of training for other jobs, but the fact remains that the attainment levels are comparatively low and they are affecting their children presently attending school. A 1970 federal report on migrant education programs summed up the situation of migrant educational attainment by saying:

> "Ninety percent of the children never finish high school. They average a 4th or 5th grade education and the only reason most of them go that far is the practice of 'social advancement'." (82)

Number of Migrant School Children. There are somewhere between 300,000 and 500,000 migrant children in school. The Office of Education in the Department of Health, Education and Welfare claims to have 220,000 migrant children participating in their programs, and they don't claim as yet to serve all migrant children. (83) The most reliable count available is probably available from the Migrant Student Record Transfer System which claimed 350,000 migrant students in 1973. (84) This computerized system expects to someday serve up to 800,000 migrant students. (85) Another count that avoids seasonal duplication in counting is to take the number of identified migrant students in the three largest "home base" states of California, Texas and Florida. Texas had 56,118 migrant students in 1972, (86) California had 48,376 migrant students (87) and Florida reported 43,138 in 1969. (88) These main supply states alone account for some 150,000 migrant students.

Number of Schools Serving Migrants. The most accurate figure available to ascertain the number of schools serving migratory farm workers would be the number taken from the Migrant Student Record transfer System (MSRTS). According to the MSRTS administrator, in 1973 the System served 7,000 active schools, with the anticipation of ultimately serving 15,000. (89)

The density of students from the families of migratory farm workers in public schools is difficult to ascertain, except on a national average. With 7,000 schools presently being attended by migrants and 350,000 migrant students there is roughly a national average of fifty migrant students per school. A study in Florida indicates the number of migrants students in 245 schools, where migrant students per school ranged from thirty-four to 1,800 (90). The average migrant population density per school in Florida was 175. Florida is a "home base" state and thus has a higher concentration of migratory farm workers living within its borders during the winter months than do most states.

Number of School Children on the Road. It is difficult to pinpoint or predict the number of children of migrants who are still "on the road," or not at a home base location, during the school year. Often children are left with relatives or friends while parents and perhaps some siblings travel for employment. Rapton indicated that of 140,000 migrant children under age fourteen about 50,000 were on the road at some time between October and May. (91) Subsequent studies (92, 93) have shown that there is movement within the home state during the school year; thus it would be inaccurate to conclude that two thirds of migrant children remain at the same residence during the school year. However, it might be fair to conclude that at least half of the children of migrants move at least once during the school year and that the remainder of migrant students have special educational needs because of their environment of migrancy even though they may attend one school a full school year.

Funding. The education of migrants is funded predominantly through state and local funds that support local schools. Since migratory farm workers have very low incomes and may pay little, if any, income or property taxes, (they do pay sales taxes) they basically do not contribute financially to their own, or their children's education. Federal funds for instructional and supplementary educational services are allocated to state departments of education under Public Law 89-10. This Law allocates spending for educational deprived children generally and contains specific clauses for migrant education. The 1970 funding level was 58 million dollars and provided services to some 235,000 migrant children (94). The funding for 1973 was 72.7 million dollars and indications are that the total will continue to increase and may be 90 million for 1976. (95) Federal revenue sharing programs do not affect P.L. 89-10 funding and thus there is no present indication of an end to this funding source. The total overall expenditure per child under P.L. 89-10 is about 200 dollars which does not even pay one-fifth of the average education cost per student in recent years.

A report on programs funded under Title I of the Elementary and Secondary Education Act by the National Committee on the Education of Migrant Children, a private organization, found the funding levels of regular and summer terms to be widely varied. (96)

> "The average per pupil expenditures in 1968-69 school year was $177 for average 7 month term: in 1969 summer

term it was $195 for average 7 week term.

> "The range of per pupil expenditure in 1968-69 school year was $11 (in Lee Co., Fla. and Las Vegas, New Mexico) to $1,002 (in Kansas City, Kansas); in 1969 summer projects the lowest supplementary expenditure per pupil was $24 (in Albuquerque, New Mexico) and the highest, $1,021 (in Spartanburg, South Carolina).

Migrant Student Characteristics and Educational Needs. A profile of the migrant child and his or her needs can be developed from available reports. One published by the California State Department of Education, based on a six-state project to develop state leadership in improving migrant education opportunities has articulated characteristics and needs as follows: (97)

Characteristics of the Migrant Child

- He is able to achieve satisfactorily when his speical needs are met.
- He is shy and may feel unaccepted.
- He is subject to a marked increase in fears as he starts to school.
- He is subject to more classroom tensions and pressures than the average student.
- He generally comes from a patriarchal culture.
- His native language is frequently Spanish.
- He is frequently learning English as a second language.
- His readiness for reading will come only after he has acquired the oral vocabulary.
- Teachers may lack understanding of his historical and cultural background.
- His concepts are limited because his learning experiences at home have been restricted.
- His educational program has had little or no continuity.
- He is absent frequently, often because of lack of proper food and clothing.
- His access to dental and medical services is limited.
- His attendance in school is frequently interrupted because his parents move on to other crop harvests.
- His opportunity for school bus transportation is often limited.
- He has experienced little success.
- His needs for personal and vocational guidance are seldom met.
- His concepts of the value of learning are undeveloped.

- He is two or more years educationally retarded due to his limited knowledge of English or to absence from school.
- His school and health records may not be transferred from one school to another.
- He has little opportunity for remedial instruction taught by remedial teachers.
- He seldom finishes the eighth grade and rarely completes a high school education.
- He is mature in the areas of travel and adult association but lacks other experience necessary for success in the classroom.
- His concept of sex and the sex roles are governed by his cultural values and may differ from middle class values.
- His parents often receive aid from welfare agencies.
- He is expected to contribute to the family income at an early age.
- He has had little opportunity for preschool educational experiences, such as kindergarten, nursery school and day care.

Based upon these characteristics, the following elements emerged in the six-state migrant study as being needed to meet the educational needs of migrant children: (98)

1. Equal opportunity
2. Attitudes favorable for success
3. Mastery of English
5. Kindergarten and preschool programs
6. Individualized learning programs
7. Broadening background and interests
8. Secondary education
9. Continuity in the educational program
10. Flexibility in education arrangements
11. Cultural background

After a rather extensive research project, a study of migrant educational needs in Florida advanced the following three recommendations to Florida state and local school administrators: (99)

I. Revisions of curriculum and instructional procedures used with migratory children.

II. Revisions of teacher training and in-service education for teachers of migrant children.

III. Revisions of some public school organizational patterns and supporting services as they relate to migrant children.

Utilizing such articulated characteristics and needs of migrants, the autonomous schools across the country and the states serving migrants develop various approaches, recommendations and objectives in regard to migrant education. Occasionally a comprehensive educational approach utilizing telecommunications is developed as is illustrated by "Program VI" later in this chapter. The extent to which migrant educational needs are met in present migrant education programs or might be met with the aid of telecommunications technology will be explored in the following pages.

Present Migrant Education Programs. Examination of numerous reports and other material on migrant education reveals an abundance of teacher guides, reading lists and special materials for migrant education.

This material is oriented predominantly to elementary education level educators. It appears to this writer that from the perspective of the migrant child the materials for his (or her) benefit are developed in a very piecemeal fashion, often uncoordinated with other schools or teachers, thus resulting in duplication of effort. For the teachers, administrators, government officials and concerned citizens that research, develop, and collect this material there appears to be wasted effort due to poor coordination and communication.

The existence of so many commissions, committees, subcommittees, research teams, task forces, study teams, church groups, foundations, interested individuals producing such an immense collection of "special" material, reading lists, orientation pamphlets, and courses indicates the general recognition of the fact that migrant children do have special problems unique from other students and that there is thus an unquestioned need for special educational material and programs for migrants.

A team of researchers observing schools and programs for the education of migrant children found: (100)

> "Most teachers, whether using textbooks or not, continued to organize classrooms and present materials in a traditional, teacher-centered classroom, manner. Some teachers asked for help. They confessed to observers their lack of understanding of what they were doing."

The nature of educational practices in the U.S. and the administration of federal funds for education is such that programs for migrants vary greatly from school to school, and state to state. Interstate meetings of teachers and administrators occur mostly to share ideas. The Migrant Student Record Transfer System grew out of one such meeting. There have evolved some new approaches in some states, some new techniques in some schools and mere continuation of old programs at many other schools. Quality and effectiveness of programs vary greatly and except for observational and subjective reports, little research or testing is done in this area.

One indicator of success in the long run would be the percentage of those students completing high school in recent years compared to pre-federal funding days. In 1970,

> "No more than 22 percent of children in sample were were enrolled beyond the sixth grade, half that for the nation as a whole. This would indicate that so far these programs have made little impact on migrant children staying in and advancing in school. Greene found in 1954 that almost 21 percent of his sample were enrolled beyond the 6th grade." (101)

There are several forces working against migrants completing high school. One is the child labor laws which allow children to work in agriculture at age fourteen. Age fourteen occurs at about the eighth grade, the average attainment level for migrants. From a fourteen year old migrant's point of view as he evaluates the world he finds that little has been gained by those around him who have continued in school. Thus from the economic standpoint of the student, when weighing present security versus possible future benefits of school, the earnings foregone by going to school after age 14 are considerable.

There is little parental or group pressure to succeed in educational attainment for latter economic gain.

> "Fatigued parents do not have the time, energy, and emotional resources that are needed for giving to their children the physical care, the guidance, the instruction, and the emotional warmth which young children so desperately need. Possessing of but limited educational attainments themselves, the parents have not been able--and are not now able--to provide their children with patterns of day-to-day and hour-to-hour behavior which the children may internalize and which, once possessed by the children, will help them to meet the expectations of those people upon whom their later advancement will depend."

The constant moving from location to location, from state to state and from place to place within states has led to very piecemeal education patterns. "Continuously interrupted studies negate achievement and build formidable barriers to self-confidence and self-respect." (103)

The mobility factor may be the most significant in terms of forces working against educational attainment. This factor has not been dealt with significantly by programs and projects involving migrant education. The Education Commission of the States sees the situation in a similar manner: (104)

> "The tradition that public education is a state responsibility has limited interstate cooperation. State education programs have been influenced by traditional pride, competitive jealousies, geographical isolation and communication limited by the more immediate demands of current crises."

In Texas the decision was made to compress the regular nine month curriculum into seven months so that migrant students could receive the benefits of education while in the state. Classes in the Seven Month Program seldom start before October 15 (six weeks late) and never continue beyond May 15 (two weeks early). (105) This program requires that migrant children be segregated from others and criticism has been raised that this is *de facto* segregation. Texas also has "Enrichment Programs" within regular school programs. In the "Extended Day" migrant children stay one extra hour for special instruction, particularly language. There is also and "Extra Service Project" where either a special teacher comes to the room or the migrant children go to a special room. Non-graded separate migrant classrooms are also available in some regular school year programs. (106)

In an attempt to deal with the intermittent educational problem migrants face the state of Texas introduced the Interstate Cooperation Project in 1966. In 1972, twenty-six Texas migrant teachers were sent during the summer into twenty states* to work with personnel of the migrant division in the host state to share an understanding of the problems of teaching Texas migrant children. (107)

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*(California, Colorado, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, New Mexico, New York, Ohio, Oregon, Utah, Virginia, Washington, Wisconsin, Wyoming.)

## TABLE 38

## PROGRAMS BENEFITTING MIGRATORY PUPILS IN FLORIDA: 1969

(in order of Decreasing Reported Frequency)

1. Language Arts Programs
2. Teacher Aides
3. Pre-school Program
4. Enrichment
5. Special Classes
6. Community Involvement
7. Family living courses
8. Tutoring Services
9. Home-school liaison
10. Earn and Learn
11. Nutritional Supplement
12. Speical Guidance
13. Vocational Program
14. Math Programs
15. Social Security Numbers
16. Projects by Individual Teachers
17. English as second language
18. Curriculum Development

Source: (108)

An indication of the types of programs benefitting migrants that were reported in 245 Florida schools is given in Table 38. Notice that most are of supplementary nature and do not affect the core of material taught to migrant children.

California has responded to the special educational needs of migrant children through an intensive effort to coordinate all programs providing services to migrant families.

> "The effort focused on establishing the most comprehensive program of services to migrant families possible, while avoiding duplication of services by the participating agency. In each county, a migrant education advisory committee was established under the leadership of the county superintendent of schools. Those committees, composed of representatives of the agencies and organizations in the county providing services to migrants, served as a coordinating body." (109)

The management coordination in California has resulted in not only changes in implementation but also in obtaining funds.

> "Federal funds supported programs under Title I, III, and V of the Elementary and Secondary Education Act, the Economic Opportunity Act, the Vocational Education Act, the Social Security Act, the Migrant Health Act, and others. Programs funded with State monies provided relocatable school housing for migrant impacted school districts, preschool education and children's centers, and regular support to schools. The State Department of Human Resources Development provided programs of employment and community organization. Counties provided programs through Departments of Public Health, Education, Public Welfare, and Housing. Many local community and service organizations also contributed to programs for migrants." (110)

Survey of Educational Needs of Adult Migrants. Statistics and virtually every report or article regarding migrants indicate high levels of illiteracy, low basic educational attainment and the need of, or desire on the part of migrants, vocational training especially in skills outside of agriculture. A study in California (111) indicates that migrants are interested in more education. The study was performed to determine the training needs of migrant workers. Ninety-three percent of those polled wanted to work outside of agriculture and wanted vocational aptitude testing.

Of the migrants polled 61 percent wanted to take vocational courses and the greatest interest was shown for the skilled trades. The study was conducted in California and the sample was composed of predominantly Mexican-Americans. The use of English provided difficulty for 55 percent of those questioned; 41 percent wanted to take English courses. Thirty percent of the males interviewed were unemployed. Educational attainment was less than seven years for 46 percent of those interviewed with 18 percent having completed high school. The study also indicated that the best time of day for adult vocational education is 6 to 9 p.m. The greatest obstacle indicated to taking courses was a lack of knowledge about what courses are available and where.

This study from California (112), indicates that there is interest in adult courses for migrants, especially vocational training programs. In order to fulfill those needs adult education programs need to be available, given at a convenient time and place, and migrants need to be informed of their existence.

## Migrant Educational Telecommunications Projects

Introduction. Telecommunications technology has been utilized in several projects to aid in education for migrants. Some of the educational purposes for which it has been used are: 1) to provide outreach via radio to interest migrants and their families in school and related activities; 2) to train teachers of migrants via radio and television; 3) to teach subject matter such as language and mathematics via television and radio and; 4) to provide health and school records of migrants to health and school officials via a computerized information system.

Descriptions of some projects involving telecommunications and migrant education follow. Telecommunications offers the potential of delivering subject matter consistent in quality and uniformly scheduled by all schools in a large geographic area so that migratory students could thus be exposed to relatively uninterrupted courses as they move. Despite this potential, only one project is described, the computerized Migrant Student Record Transfer System which deals with the mobility factor by attempting to keep schools informed of migrants past records, but in which no attempt is made to coordinate course content or scheduling. Funding for all projects described was, at least in part, through Title I, Public Law 89-10, also known as the Elementary and Secondary Education Act of 1965.

Project Move Ahead. The Mesilla Valley of Dona Ana County, New Mexico was the site of a bilingual migrant FM radio project. (113) The project originated in the fall of 1967 with three public school districts cooperating in the program.*

Bi-lingual radio lessons were presented daily to more than 400 migrant students in thirteen different elementary schools in the Valley.

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*Las Cruces School District No. 2, Anthony-Gadsden District No. 16, and Hatch Valley School District No. 11.

Accompanying the radio broadcasts were follow-up activities that the teacher or educational technician could utilize with students in the classroom. Some twenty-nine aides were supplied to participating teachers for the duration of the program. Participating teachers received special in-service training. Classroom use of the program was voluntary on the part of the teacher. FM receivers were made available to participating classrooms.

Transmission of the programs was accomplished by using the local public broadcasting station, KWRG. The KWRG studio is located at the New Mexico State University in the mass communications department.

The project included daily developmental language lessons "to increase verbal functioning through conceptualization programming among sub-lingual children in the target schools." (114) The programs were directed towards students requiring individual attention in communication skills.

According to a Project Move Ahead report,

> "An umbrella approach incorporating Title I ESEA programs, Head Start Program, a community Migrant Ministry, Home Education Livelihood Program was utilized to meet the needs of the student population." (115)

Parents and members of various community organizations were involved in making educational materials for the students to use. Parents were shown how the materials were used in the classroom and they often followed the programs at home. Some 3,000 students not part of the migrant target group also benefitted. (116)

In this project an existing radio station was utilized so that no new network capability was established. Rather a target school population consisting of children of migratory farm workers was identified and a series of programs developed to address their need to develop language skills in English while maintaining a pride of and relationship to their Mexican heritage. Schools where migrants children attended in concentration were chosen and radios distributed to target classrooms. The low level of new hardware needed for this project makes it seem a good model for others to attempt where costs are crucial and educational telecommunications networks exist.

Although KWRG presently broadcasts some bilingual programs there is no longer a program specifically geared for language development within the schools. Dr. Alma Barba, the former coordinator of Project Move Ahead, relates that departure of the administrator and funding problems caused the project's demise at the end of 1969. (117)

FM Radio Project, Florida. WHRS/FM is owned and operated by the Palm Beach County School Board. The radio station broadcasting center is located in Boynton Beach at the Hagen Road Elementary School. (118) One of the prime motivating forces for establishing the radio station was the FM Oral Communication Project for Migrants. In the early phase, the radio project was mainly an "outreach" program to the home from the school to involve parents and migrant students in school activities. No in-school programs were broadcast initially, although plans called for future use of radio programming within the classroom setting.

Broadcasting at 91.7 megahertz, the station reaches more than just migrants. In 1970 the participating schools had identified

316 Blacks, 83 Puerto Rican and 702 Mexican American migrants but there were also 30,000 students in the high schools and 36,000 in the grade schools in the area. (119) Many programs are broadcast in Spanish.

Initial funding was predominantly Title I and Title III E.S.E.A. funds. The first year of operation included the distribution of 260 radios. Funding was at the 62,000 dollar level the first year. The budget for 1970-71 was 68,000 dollars with funding from the Corporation for Public Broadcasting, State Migrant Child Education, State Department of Learning Resources, and Adult Education. (120)

The objectives were: (121)

1. To reduce the school drop out rate.
2. Increase the children's participation in class as rated by the teacher.
3. To improve the performance of the student in both course work and on standardized achievement tests.
4. To improve children's average daily attendance.
5. To increase the participation by the family in school related activities.

All but objective 3 have exceeded expectations in the opinion of the Palm Beach County Board of Public Instruction. (122) There was a four fold increase in adult education programs and the teachers judged the radio project to be a "highly motivational tool." Parents and students were informed of daily activities at school which caused an increase in attendance.

There were many special talks on the radio programs about services in the county. There was generally a noted increased awareness, a more informed migrant community and a greater sense of community as expressed by the greater participation in school activities. Students occasionally made presentations on the radio. These activities still continue today to some extent but to a lesser degree than in the early phase of the project.

Now in 1974 WHRS-FM is active in instructional broadcasting for in-school use. (123) Daily from 9:40 a.m. until 2 p.m. instructional programs are broadcast for junior and senior high school level, but primarily for fifth and sixth grades. Two of the instructional broadcasts are produced locally while the remainder are obtained from National Public Radio (NPR) or other educational sources. From 6 a.m. until 9:40 a.m. and from 2 p.m. until midnight the bi-lingual outreach programs are broadcast as well as fine arts, and public radio productions. (124)

A second quarter 1974 survey indicates a prime potential audience of 381,364 for WHRS. (125) The radio project presently has 7 employees, which are occasionally supplemented by high school student volunteer announcers.

Although previous efforts directed towards migrants would appear to have been responsive to migrant needs, WHRS is now changing its programming emphasis to "Fine Arts Instructional Radio" due to several factors. Migratory farm workers are having to move farther West as condominium construction displaces agricultural land use. Funds are now provided by the Corporation for Public Broadcasting, State Board of Education, the local school board, and federal migrant education Title I, P.L. 89-10 funds. Federal funds for migrant education will not be renewed for FY '76 due to the decline in migrant participation. (126) There evidently was little encouragement given to the station to expand broadcasting westward via cable or repeaters to parallel the movement of migrants.

Because WHRS/FM is owned and operated by the Palm Beach County School Board and because of the large potential non-migrant listening audience and little, if any, migrant input to station control, the station has decided to shift its emphasis. WHRS is now in transition from heavy migrant audience emphasis to emphasis on fine arts and instructional radio broadcasting. Station personnel are presently promoting the use of radio and television instruction to schools in the listening area. Although the station will obviously serve a larger audience, the shift in emphasis in the opinion of this author, will be a loss to progress in migrant education.

Program VI; Video Project for Migrant Education. Six pilot school districts in New Jersey are the focus of a project to use closed circuit television and eventually plan to use public television for program dissemination to migrant students. Initially the project was entitled Pilot V because only five school districts* were involved. The goals of the project are to provide sequence and continuity for the reading, math, social awareness and language programs directed to the migrant audience in the schools.

The immediate objectives are: (127)

> "To consolidate the skills of teachers, educational consultants, curriculum specialist, multi-media specialists, language and reading specialists, mass media specialists, and a citizens

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*Downe, Mannington, Franklin, Woodstown-Pilesgrove, and Lawrence Townships. A sixth township was added in recent months.

> advisory council to design and produce ETV programming to meet the stated objectives.
>
> "To develop a comprehensive set of curriculum materials (Curriculum Guides, and Video-Tapes) to support programs in reading, math, and language (bi-lingual/bi-cultural).

To achieve these goals a survey was first conducted to ascertain needs. In undertaking the needs survey a number of sources were probed including parents of migrants, professional staff who teach migrants, the Pilot V Parent Advisory Council, migrant students attending school in New Jersey in 1971-72, and several literature surveys that covered migrant education, disadvantaged children and all children in general. (128) Then, during 1973 the Curriculum Development Team and the Multi-Media Production Teams in consultation with the Citizen's Committee and other consultants began producing programs. The administrative structure of Pilot V as of 1973 is given in Figure 13 to show the inter-relationships utilized in producing the program material. Programs were first utilized in the six pilot schools in 1974, and in a mobile educational unit that visits a school each semester.

As the programs are being produced a studio in southern New Jersey video tapes the programs in English and Spanish. At the close of 1974 the programs had been produced exculsively on reel to reel video tape. In 1975 a switch to the cassette format will be made. Six or seven copies of each program are made on video tape. The tapes are part of a package that includes booklets, worksheets, etc. for the migrant students to use before and after the tapes are viewed. (129)

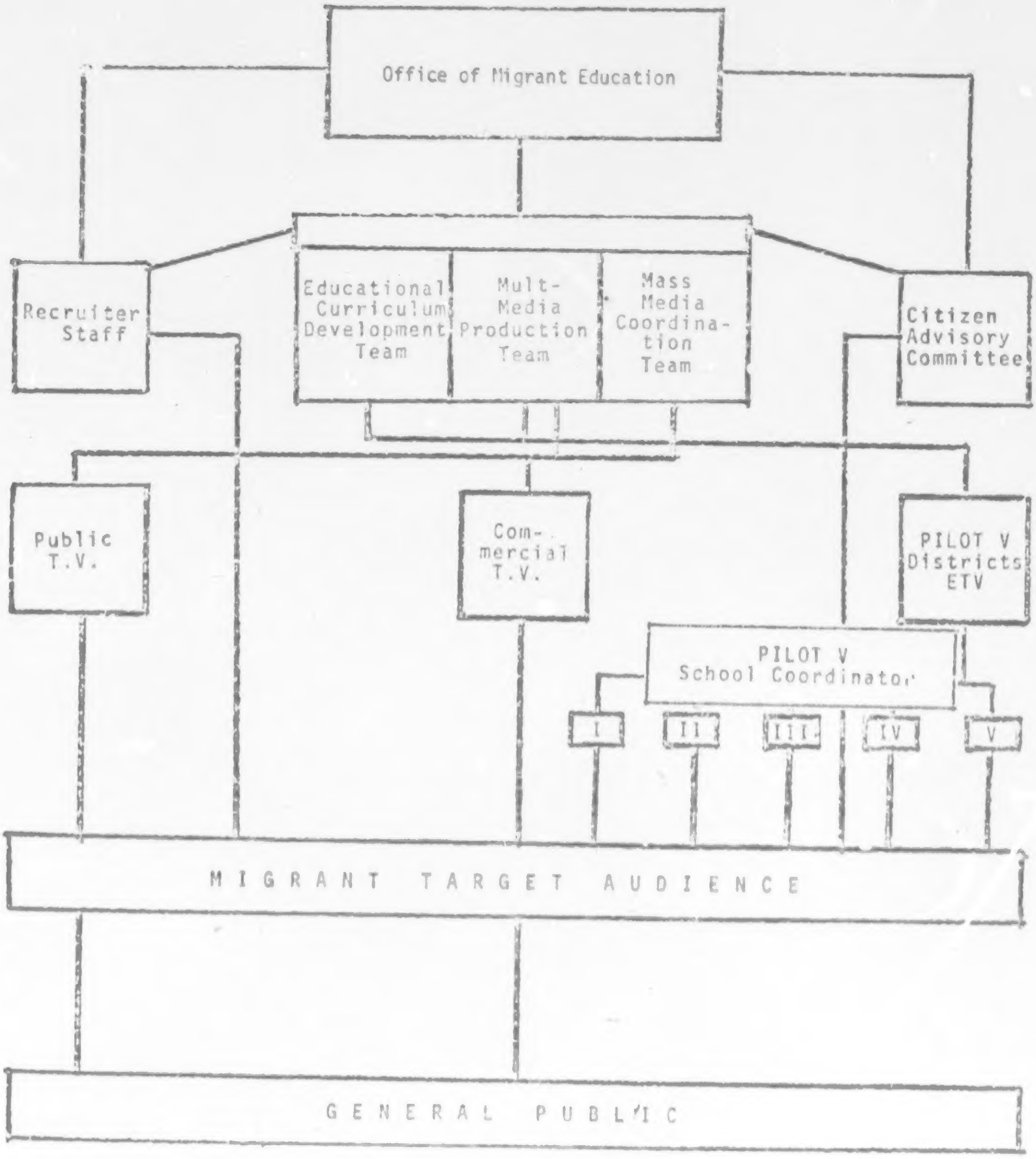
Office of Migrant Education
Recruiter Staff
Educational Curriculum Development Team
Mult-Media Production Team
Mass Media Coordination Team
Citizen Advisory Committee
Public T.V.
Commercial T.V.
PILOT V Districts ETV
PILOT V School Coordinator
I
II
III
IV
V
MIGRANT TARGET AUDIENCE
GENERAL PUBLIC

Figure 13

ADMINISTRATIVE ORGANIZATION OF PILOT V*: 1973

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*Now renamed Program VI

Source: Pilot V, New Jersey Department of Education, Office of Migrant Education.

There are four major divisions in video lessons: (130)

1. pre-teaching activities involving interaction of teachers and students.
2. the video tape presentation of the instructional concept.
3. The post-teaching activities which provide reinforcement involving interaction of teachers and students.
4. evaluation procedures.

The four part division indicates a design that will outline the roles and responsibilities for the teachers which may aid in the transition from more traditional practices but still keeps the teacher in control of activities. Teachers who participate in the program are specially trained through an in-service training program. Additionally, teachers can tape classroom activities for evaluation purposes.

Fall 1974 has witnessed the use of the comprehensive lesson plans with video taped (in English and Spanish editions) programs from kindergarden to third grade. The use of the tapes and lessons lasts about one-half day per student. Grades four through six in the six pilot schools have video tape equipment and the students write and make their own programs in a "hands-on" project. (131) The purpose of the television format is to sustain the interest of migrant students through a visual and oral presentation.

Total funding through Title I, ESEA for Fiscal Year 1975 is 207,048 dollars. The cost for the video lessons, as of 1974, was 536 dollars per minute, which includes seven copies of the video taped audio-visual segment, the in-service teacher training, lesson plans, and the development and production costs. (132) An additional goal of the project is to educate the communities in the surrounding area about migrants, migrant problems and migrant education. The original plans called for production of videotapes for broadcast over nearby commercial and public television networks, but these media have not yet been used to any great extent.

Despite some funding difficulties and some delays in program production, (133) the Pilot VI program seems to be operating well. An initial indicator comes from the results of a Master's thesis undertaken by one of the curriculum development staff. The thesis, relating to the area of learning and disabilities, included testing of participating students reading and phonetic development which showed gains in reading over the non-television taught students and almost identical scores in phonetics. (134) Some interest from other states (Florida and New York) has been shown at meetings of state directors of migrant education programs. Whether Program VI, or some similar comprehensively developed project utilizing video programs, will be incorporated in migrant education programs on a multi-state basis remains to be seen.

Migrant Student Record Transfer System. The Migrant Student Record Transfer System (MSRTS) was established after an interstate meeting of state directors of migrant education in 1968. The System which began limited operations in 1971 is funded by Title I funds from the Office of Education, U.S. Dept. of Health, Education and Welfare, but coordinated by all state directors of migrant education. The central unit of the system is a computer located in Little Rock, Arkansas. There are 137 teletype terminals in 44 states connected by WATS lines to the computer; the remaining four states use terminals in adjacent states. (135)

Once a school identifies a child as being a migrant it communicates available information to the nearest teletype operator on a form. The teletype operator transmits this identification information to the central computer facility in Arkansas. MSRTS sends via wire a condensed version of the student's record in return. The complete record of the student is obtained from the computer during the night and mailed to the school the next day.

The type of information that is collected and transmitted is: (136)

A. School attendance patterns
B. Parent/guardian relationship to student
C. Kinds of health screening and when
D. Health screening findings and treatment
E. Urgent health conditions
F. Status of treatment procedures
G. Innoculations administered
H. Student's chronic health condition
I. Standardized tests administered, date, score
J. Special educational progress of student involved.

About 350,000 farm migrant children were being served. (137) The cost per student in Fiscal Year 1972 was 4.89 dollars (based on 313,188 students and 1,966,065 for FY 1972). (138) The cost per record transfer in FY 1973 was 2.51 dollars (based on 543,000 transactions for first nine months of FY 1973 and 1,363,905 or three-quarters of FY 1973 budget). (139) The MSRTS served 7,000 schools in 1973 and the administrators of MSRTS hopes to eventually serve 12,000 to 15,000 schools and up to 800,000 students. (140)

A doctoral dissertation by Felipe Veloz (141) evaluated factors related to usage of the Migrant Student Record Transfer System in five states with high migrant student concentration. He surveyed

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*Arizona, California, Colorado, New Mexico, Texas.

those schools with terminals, those which did not have terminals in the school but used the system, and those schools which did not have a terminal and did not use the system. His findings indicate some of the problems large scale telecommunications systems might encounter.

In determining the extent of usage of the MSRTS, Veloz found that familiarity with the system and what it could do were significant. The size of the school or the presence of a MSRTS teletype terminal in the school building were not determining factors. Among schools that did not utilize the MSRTS, a common factor found was the lack of clear objectives with regard to the education of migrants and the accompanying lack of evaluation of the extent to which these objectives were being achieved. (142)

There was a need found for personnel involved to get better training to understand and use the MSRTS. It was suggested by Veloz that school superintendents, principals, and curriculum directors be given special preparation and orientation to the MRSTS. Many schools did not designate one person to be responsible for handling MSRTS affairs. Also the establishment of special teacher training programs was recommended to train teachers, especially former migrants, to teach migrants.

Some other findings by Veloz were that schools not using MSRTS spent more funds per student than did those schools that did use MSRTS. It was found that no standardized form was used to identify migrants and Veloz suggested that one be developed. It was discovered that there was often little information available to teachers via the MSRTS on students from previous schools.

Veloz suggested that with refinements and greater school participation the MSRTS could become the center of evaluation of migrant education programs. The federal government could utilize data generated by the MSRTS such as the location of migrants in schools for funding distribution the time students reside in a given state, the test results after participation in various schools, etc. (143)

Technically the MSRTS seems to be functional. The cause of the problems found in schools not using the system, or making little use of the system, seem to be related to internal school management practices. A centralized information system inter-connecting schools that are administered locally such as the MSRTS seems to exhibit variations in usage based on differences in administration at school locations. In response to this problem Veloz recommended standardization of MSRTS procedures and school site training in use of the MSRTS to produce higher usage rates and better information dissemination on migrant students based on more uniform use techniques. (144)

Without a centralized administration of the MSRTS, standardized administration at the local school level, or perhaps new incentive based procedures, the MSRTS system may begin to lose its credibility and usefulness through low usage thus resulting in further inadequate and haphazard information dissemination on migrant students.

Administration of this computer based large scale system or other such telecommunications systems may become more critical to continued success than the technical capability. Privacy is safeguarded by limited-access to the computer stored information. Requested information on migrant students is mailed to school authorities and thus cannot be electronically intercepted.

It should be pointed out that the study by Veloz emphasized factors affecting usage of the MSRTS. It would also appear to be important to evaluate the extent to which the system is effective in aiding administrators, teachers and education planners concerned with improving migrant education. To the authors knowledge, no overall evaluation of this kind has yet been completed.

TESOL-Visual Literacy, A Non-Mediated Project. In 1970 the Teacher Corps Rural-Migrant group, affiliated with the University of Southern California, desired to link migrant children into the public schools. (145, 146) Part of the child-centered education developments with migrant children was the evolution of the inclusion of a visual literacy component in Teaching English as a Second Language (TESOL) to Spanish-speaking California migrant children at the Yettem School in Tulare County. Recognizing that children entering school have a language, a vocabulary of approximately 14,000 words and five years of experiences, the visual literacy component was designed to build on those positive aspects which are often neglected when the child enters school speaking Spanish and cannot communicate or relate to teachers and classmates who share a world in English. (147)

The basic process of the TESOL-Visual Literacy involves four steps:

1. The child takes a picture that tells a story;
2. The child talks with his peers about the picture print-out;

3. The child tells a story about his picture and records it, and the story is transcribed to a typewritten print-out;

4. The child reads his story as he hears his voice telling it on the recording.

Through this process a child writes his own reading material. The stories are collected in a binder and as the year progresses several photographs are taken at a time to produce increasingly longer stories. Eventually they start exchanging books and they learn to read other's stories without the tapes.

In the bilingual setting children would ask each other and teachers for words in English. The teachers took material from the children's stories to use for drills in vocabulary and syntax. (148)

This project uses a somewhat different approach than most classroom reading lessons which are teacher and textbook centered. Success was achieved in language development by using a child-centered, camera based project focusing on the child's accomplishments and interests to generate vocabulary words for study. This project illustrates the importance of the visual elements of non-English speaking children that can be augmented through technology to provide a transition to the use of English.

Eventually many children in visual literacy projects produce movies of their stories. (149) It would appear that child produced movies, or a similar approach, could potentially be utilized in programs for large scale delivery to other children in bilingual settings once they have progressed through the initial literacy phase.

Carrascolendas: Bilingual Education Through Television Following the example set by "Sesame Street" a project was established in the Southwest to use television to address Mexican-American children. "Carrascolendas" is the resulting program series that is bilingual (English and Spanish) addresses a specific cultural group and has specific educational goals, which can be verified with behavioral testing. (150)

Initial funding for "Carrascolendas" was from Title VII, The Bilingual Education Act, which is part of the larger National Defense and Education Act of 1967. The project was initiated in July 1970 through the Education Service Center, Region XIII, at Austin, Texas. In turn, a subcontract was made with educational television station KLRN for the development of the series and to the Center for Communication Research, at The University of Texas, for its evaluation. (151)

During the first two years of its existence Carrascolendas was viewed mostly by people (adults as well as children) in Texas within the broadcast range of KLRN. During the third year, 1973, the 30 program series was made available to other educational stations through the Public Broadcasting Service; forty-five public television stations carried "Carrascolendas."

The series incorporates,

> "a broad range of presentational techniques such as actors, puppets, films, music, dance, and special effects to provide innovative, attractive, and entertaining enrichment of classroom activities. In the development of program material, emphasis was placed on bilingualism, Mexican-American culture, the Mexican and Spanish heritage, and the multicultural society of the United States. Throughout the series the Spanish language, Mexican-American actors, Mexican-American personalities, music,

> games, dances, rhymes, and other elements of Hispanic tradition reflected the bilingual/bicultural environment of the target audience." (152)

"Carrascolendas" is directed to kindergarden through third grade audiences of Mexican-American background in rural settings. Specific behavioral objectives were defined for the following areas: self-concept, science, history/culture, language skills, phoneme/grapheme relations, and math.

Testing conducted by the Center for Communication Research the University of Texas has shown that the series has been effective in achieving many of its goals in terms of changes in behavior and gains in course content comprehension test results. The tests were conducted among students viewing "Carrascolendas" (both with and without supplementary materials), teachers, parents and those producing the series. (153)

Funding for FY 74 was continued by the National Center for Educational Technology, U.S. Office of Education. The series was to undergo some development to also target the program material to Puerto Rican and Cuban children audiences.

Although this bilingual series is not addressing migratory children specifically, it does seem to address some of the language and cultural orientation needs of Mexican-American children. It therefore may prove useful in helping migrant children of Mexican-American or other Spanish-speaking background to deal with material in the educational sector by approaching the child from his cultural and language perspective. Further research and experimenting seem proper before it can be said that this, or similar television series, are as adequate for migrants, as the "Carrascolendas" evaluators claim for Mexican-American Children:

> "In short the practical implication is that if culturally targeted programming is to be developed for the schools, instruction in self-concept and history/culture are objectives that may benefit best from the advantages of the television medium. At the same time such televised instruction should aid us in overcoming some of the shortcomings of the schools and the teachers in meeting the needs of minority-group children." (154)

It would seem that the specific problems created by mobility and the subsequent alienation produced in migrant children should also be addressed to be truly effective for migrant children.

## Summary and Conclusions

Less than one million persons, including children, have been identified who migrant in a north and south pattern to work in agriculture-related tasks, mostly the harvesting of perishable crops. Many of the people who are part of the three streams that move north and south each year are from minority groups, mostly of Mexican descent. Pay for farm work is low and erratic resulting in almost certain poverty for migrants. Language difficulties, health problems and low educational attainment are common sources of difficulty.

Agri-business has changed in ways that have resulted in a decline in the number of farm employees due to increased consolidation and vertical integration. Indications are that interstate and intrastate migration for the purposes of farm work will not end, despite radical changes in entrepreneurship in farming. Farm labor is intrinsically connected to the present agricultural-agribusiness, structure and although indications are for a substantial reduction in total numbers, no clear end of seasonal farm labor needs in certain crops is forseen.

Some 350,000 children of migrants have been identified. There has been special funding since 1965 for educational services for migrant children under the Elementary and Secondary Education Act, Title I. The programs established under Title I are usually school-centered rather than migrant-centered, that is, support is made available to schools rather than to groups concerned primarily or exclusively with migrant education. There is some reason to believe that the school-centered strategy may be of limited utility to migrants. The experience of WHRS in Palm Beach County, Florida and the Las Cruces, New Mexico schools indicates that the needs of schools and migrants may be compatible at one point in time, but then diverge. On the other hand, "Program VI" may be effective because of its systematic, comprehensive concept based on a migrant-centered approach derived after careful analysis of migrant educational needs. Adoption of "Program VI," or programs similar in nature, by other states would indicate a direction towards more migrant oriented programs.

Special summer programs for migrants are usually run at the convenience of the school, despite timing of migrants who may arrive at the end of the summer and remain until fall. (155) The special migrant programs have probably done more to indicate the inadequacies and needs in rural schools than they have to actually increase educational attainment for migrants. The programs have not ended migrancy or the intermittent school attendance based on constant movement, and seem to have done little to reduce poverty, or parental apathy.

According to a 1971 report on migrant education in California:

> "Since the families employed at any one stop do not often move along the same route, neither mobile schools nor educational information can accompany the group. What is needed is a widespread collaboration among the many schools involved. Such collaboration should extend beyond the transfer of data to the educational planning and coordination of programs, methods, materials, and even philosophy." (156)

To the author's knowledge, as of 1974, no program has attempted to coordinate educational programs for migrants as they migrate. A step in this direction is the Migrant Student Record Transfer System (MSRTS) the computer-based system which makes migrant student health and school records readily available to schools across state boundaries. A MSRTS is a system that can improve the flow of information concerning the student's past problems and accomplishments but does not inherently change the piecemeal nature of the curriculum a migrant child experiences. There are, at present, no strong incentives for schools to utilize the MSRTS, and, thus an insufficient amount of information has been received by many teachers requesting student records. Perhaps once the MSRTS is better established and a considerable number of records have been accumulated on migrant students, the derived documentation will convince educators and planners of the need for a coordinated inter-state approach. Systems like MSRTS could be modified or expanded to enhance such efforts.

A critical need in the education of migrants is better preparation of migrant children for participation in today's schools through programs that can address three factors, namely the language gap between child and teacher, the confidence of the child for participation in school learning activities, and the discontinuous attendance patterns of migrants. It seems plausible to develop special programs, perhaps mediated, that would teach with bilingual-bicultural techniques, even for those who speak various dialects of English but still with a different cultural orientation. Education programs should be developed that instill confidence in migrant children to participate in school by building on the child's skills and interests. It would seem that any program, regardless of quality, will be less than effective if not completed by the student, so that steps should be taken to either condense programs to insure completion at each location, or, design a system where continuity can be assured through some sort of coordination between schools.

Older migrant students and adults have specific needs that deserve attention. High school level migrant students are in need of encouragement to continue school. Sources need to be developed geared especially to the interests and orientation which they uniquely have at that time in their lives. Also needed are programs for adult migrant education, particularly vocational education so that shifts can be made by migrants to other occupations as jobs in agriculture dwindle.

Public television programs, such as "Carrasolendas," or "Villa Alegre," produced by the Bilingual Childrens Television Workshop, clearly have the potential for providing useful input to the education of migrant children of Spanish speaking background. Public television is becoming ubiquitious in the United States and, therefore, these high quality television programs can move with migrants from state to state. However, it should be kept in mind that these programs were not specifically targeted for migrants. Therefore, the extent to which they are applicable needs examination. Without sympathetic reinforcement, such programs may be of limited usefulness to migrants.

Several educational projects involving migrant audiences that utilize telecommunications are in operation or are planned. The use of radio was found effective in bilingual teaching in New Mexico with Project Move Ahead and in outreach to migrants in Palm Beach County, Florida, where greater participation in school and school activities was generated. A videotape project, Program VI, is underway in New Jersey that may provide a model for migrant-centered, systematized, planned curriculum that can be disseminated via television networks to many schools. The TESOL-Visual Literacy project has provided an example of bilingual education utilizing technology to help bridge the gap from the visual world to the spoken.

The low total number of migrants, the powerlessness of migrants, the lack of clear objectives by schools serving migrants, the piece-meal information materials available to teachers and programs all contribute to an unfortunate situation for the migrant children involved. Despite increased funding on the part of the federal government there is no strong indication from the states that they will implement, in the near future, a unified effort to coordinate, on an inter-state basis, educational programs for migrants. Quality of programs may increase in places as the result of uncoordinated individual efforts but the overall situation may not improve. Migrants, being quite powerless and underrepresented (if at all) do not yet seem able to be their own spokesperson to push for long needed changes, such as unified national efforts to coordinate curriculum. Local telecommunications-based education projects for migrants will no doubt continue, but no migrant-oriented large-scale telecommunications-based effort is evident.

## FOOTNOTES

### Chapter IV

1. A V. Kreps, Jr., "Agribusiness U.S.A.: Management Responsible Only to Itself," U.S., Senate, Subcommittee hearings, Migratory and Seasonal Farmworker Powerlessness (Washington, D.C.: Government Printing Office, 1970).

2. Robert C. McElroy, The Hired Working Force of 1971, U.S. Dept. of Agriculture, Economic Research Service, Agric. Econ. Report No. 222, (Washington, D.C.: Government Printing Office, Marcy 1972).

3. Ibid.

4. U.S., Senate Subcommittee on Migratory Farm Labor, Hearings, 1969, op. cit.

5. Jay Randal Perrine, Negroes Between Crops and Whites: A Cultural Study of Domestic Negro Migratory Agricultural Workers of the East Coast Stream, (B.A. Thesis, Goddard College, 1969).

6. Julian Samora, "Immigration History Provides Key: AGENDA (Washington, D.C.: National Council of La Raza, Winter 1973).

7. U.S., Department of Health, Education and Welfare, Children at the Crossroad, Title I E.S.E.A. Report (Washington, D.C.L Government Printing Office, 1970) p. 11.

8. Consulting Services Corporation, Seasonal Farm Workers in the State of New Jersey (Seattle, Washington: March 1968.)

9. U.S., Dept. of H.E.W., op. cit.

10. John Steinbeck, The Grapes of Wrath, (New York: Viking Press, 1939).

11. James Agee and Walker Evans, Let Us Now Praise Famous Men (Cambridge, Mass.: Houghton Mifflin, 1960).

12. Carey McWilliams, Factories in the Field (Boston: Little, Brown and Co., 1939).

13. Truman E. Moore, The Slaves We Rent (New York: Random House, 1965).

14. Steve Allen, The Ground is Our Table (New York: Doubleday, 1966).

15. Dale Wright, They Harvest Despair (Boston: Beacon Press, 1965).

16. Robert Coles, Uprooted Children; The Early Life of Migrant Farmworkers (Pittsburgh, PA.: University of Pittsburgh Press, 1970).

17. William H. Friedland and Dorothy Nelkin, Migrant; Agricultural Workers of America's Northeast (New York: Holt, Rinehart, Winston, 1971).

18. Jay Randal Perrine, op. cit.

19. U.S., Department of Agriculture, from U.S. Senate Subcommittee Hearings on Migratory Farm Labor, op. cit., Vol. 7-A.

20. Children at the Crossroads, op. cit.

21. McElroy, The Hired Farm Working Force of 1971, op. cit.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid.

26. Children at the Crossroads, op cit., p. 33.

27. Senate Subcommittee hearings on Migratory Farm Labor, op. cit., p. 28.

28. Ibid, Part K, p. 132.

29. James M. Pierce, The Condition of Farm Workers and Small Farmers in 1971, (New York: National Sharecroppers Fund, 1972) p. 6.

30. U.S. Senate Subcommittee Hearings Migrant Farmworker Powerlessness, op. cit.

31. Robert C. McElroy, "Agriculture Manpower Needs and Opportunities," Remarks before the Northeast Farm Labor Research Committee, McAllen, Texas, Dec. 12, 1972, copies distributed by the U.S. Department of Agriculture.

32. U.S., Department of Labor, Manpower Administration, Rural Manpower Development, (Washington, D.C.: Government Printing Office, March 1972).

33. U.S., House of Representatives, House Subcommittee on Agriculture Labor, 92nd Congress, Hearings (June 1971).

34. U.S. Department of Labor, op. cit.

35. Michigan Employment Security Commission, 1970 Farm Labor and Rural Manpower Report, ED-051-939.

36. Texas Good Neighbor Commission, Texas Migrant Labor; Annual Report 1970, (Austin, Texas: 1971).

37. McElroy, op. cit.

38. Ibid.

39. David S. North, "U.S. Government Moving to Cut Back Immigration from Mexico," AGENDA, (Washington, D.C.: National Council on LaRaza, Winter 1973), quoted from Immigration and Naturalization Service, U.S. Dept. of Justice, Annual Reports.

40. Ibid.

41. U.S., Supreme Court, Saxbe v. Bustos, No. 73-300 and Cardona v. Saxbe, No. 73-480, decided November 25, 1974. Mr. Justice Douglas delivered the opinion. U.S. Supreme Court Bulletin (New York: Commerce Clearing House, Inc., issued continuously).

42. U.S., Department of Labor, and U.S. Dept. of H.E.W., Domestic Agriculture Migrants in the United States, Public Health Publication No. 540, (Washington, D.C.: Government Printing Office).

43. U.S., Department of Commerce, Bureau of the Census, 1970 Census. (Washington, D.C.: Government Printing Office)

44. Lenore Epstein. "Migrant Farm Workers," Social Security Administration Bulletin, No. XXVI (Washington, D.C.: Government Printing Office, 1963).

45. Avra Rapton, Domestic Migratory Farmworkers; Personal and Economic Characteristics, U.S. Dept. of Agriculture Report No. 121, (Washington, D.C.: Government Printing Office, September 1967), p. 14.

46. Consulting Services Corporation, Migrant Farm Workers in the State of Washington (Seattle, Washington: Consulting Services Corporation, 1966.)

47. LaVerne B. and Maurice E. Thomasson, A Demographic Study of Farm Migrant in Delaware (Dover, Delaware: Vocational-Technical Division, Delaware Department of Public Instruction, September, 1969) ED-023-522.

48. Ibid.

49. Ibid.

50. Texas Good Neighbor Commission, _Special Report 1970_, (Austin, Texas: 1971).

51. Texas Good Neighbor Commission, _1969 Texas Migrant Labor Annual Report_, (Austin, Texas: 1970).

52. Robert C. McElroy, 1972, op. cit.

53. Texas Good Neighbor Commission, _Texas Migrant Labor 1970 Annual Report_, (Austin, Texas: 1971).

54. Thomasson, op. cit.

55. Avra Rapton, 1967, op. cit., p. 4.

56. Robert C. McElroy, _Hired Farm Working Force of 1971_, op. cit.

57. U.S. Dept. of Agriculture, U.S. Senate Subcommittee on Migratory Farm Labor, Hearings, op. cit., pg. 17.

58. Texas Good Neighbor Commission, _Texas Migrant Labor; 1970 Report_, op. cit.

59. Nicholas Wade, "Agriculture: Social Sciences Oppressed and Poverty Stricken," _Science_, (18 May 1973) p. 719, discussing Jim Hightower, _Hard Tomatoes, Hard Times_ (Cambridge, Mass.: Schenkman, 1973).

60. Michigan Employment Security Commission, 1970, op. cit.

61. Richard Bela, "Structure of the Farm Labor Market," U.S., House of Representatives, Hearings of the House Subcommittee on Agriculture Labor, June 10, 1971, (Washington, D.C.: Government Printing Office, 1971.)

62. Peter Matthiessen, _Sal Si Puedes: Cesar Chavez and the New American Revolution_, (New York: Random House, 1969.)

63. Consulting Services Corporation, 1966, op. cit.

64. Texas Good Neighbor Commission, 1970 Annual Report, op. cit., p. 10.

65. Robert C. McElroy, Economic Research Service, U.S. Department of Agriculture, "Migratory Farmworker Problems and Needs." Talk before the National Manpower Advisory Committee, Washington, D.C., June 18, 1971. (Copies distributed by the Department of Agriculture).

66. U.S., Bureau of Census, 1969 Census of Agriculture, "Farms: Number, Use of Land, Size of Farm," (Washington, D.C.: Government Printing Office, 1970), p. 11.

67. Ibid.

68. Susan A. Lippin, "Developments in Farm Labor Unionization," Rural Manpower Developments, Sept/Oct 1971 issued by Rural Manpower Service, U.S. Department of Labor, (Washington, D.C.: Government Printing Office, 1971).

69. Marshall Harris, Entrepreneurial Control in Farming, U.S. Department of Agriculture, ERS No. 542, (Washington, D.C.: Government Printing Office, 1974) p. 1.

70. A. V. Kreps, Jr., "Agribusiness, U.S.A.: Management Responsible Only to Itself," prepared for Senate Subcommittee on Migratory Farm Labor, Hearings, Migrant and Seasonal Farmworker Powerlessness, April 15, 1970, op. cit.

71. Richard A. Givens, "Legal Disadvantages of Migratory Workers," Labor Law Journal, Sept. 1965, pp. 585.

72. Peter Barnes, "The Future of the United Farm Workers; Chavez Against the Wall," The New Republic, December 7, 1974, pp. 13-16.

73. McElroy, 1971, op. cit.

74. U.S., Department of Labor, National Migrant Worker Program Handbook, (Washington, D.C., mimeographed, March 1972), p. 5.

75. Perrine, 1969, op. cit.

76. Coles, op. cit.

77. W. L. Goodwin, Bucknell Conference on Learning Problems of the Migrant Child: Report of Proceedings, (Lewisburg, PA., Bucknell University, 1967).

78. U.S., Senate Report of the Committee on Labor and Public Welfare, Migrant Farm Labor Problems in the U.S. (Washington, D.C.: Government Printing Office, 1969).

79. Thomasson, 1969, op. cit.

80. Texas Good Neighbor Commission, 1970 Annual Report, op. cit.

81. Avra Rapton, 1967, op. cit., p. iii.

82. *Children at the Crossroads*, op. cit., p. 1.

83. U.S., Senate Subcommittee Hearings, op. cit.

84. Maxwell Dyer, *Children of the Four Winds; The Migrant Student Record Transfer System*, (Little Rock, Arkansas: Department of Education, April 1973), ED-087-456.

85. Personal correspondence with Winifred Miller, Administrator, M.S.R.T.S., April 25, 1972.

86. Texas Education Agency, *Texas Child Migrant Program*, (Austin, Texas: Texas Education Agency, Fall 1972).

87. California State Department of Education, *California Plan for the Education of Migrant Children*, Fiscal Year 1970, (Sacramento, California: 1970), p. 13.

88. E. John Kleinert, and others, *Migrant Children in Florida, Phase II*. Report of the Florida Migratory *Child Survey Project 1968-69*, (Caral Gables, Florida: Miami University, August 1969), ED-045-255.

89. Correspondence with Winifred Miller, op. cit.

90. E. John Kleinert, 1969, op. cit.

91. Avra Rapton, 1967, op. cit., p. iv.

92. E. John Kleinert, 1969, op. cit.

93. Texas Good Neighbor Commission, *1970 Annual Report*, op. cit.

94. U.S. Dept. of Health, Education, and Welfare, Office of Education, *Directory of Consultants on Migrant Education*, (Washington, D.C.: Government Printing Office, Dec. 1970), ED-045-277.

95. Phone conversation with Mrs. Horner, Migrant Programs, Fiscal Office, U.S. Department of Health, Education and Welfare, Oct. 30, 1974.

96. National Committee on the Education of Migrant Children, Summary and fact sheet on *Wednesday's Children: A Report on Programs Funded Under Title I of the ESEA*, (145 East 32nd Street, N.Y.: National Committee on the Education of Migrant Children, March 1971).

97. California State Department of Education, *Education for Farm Migrant Children: Report on the Six-State Project for Developing State Leadership in Improving the Education Opportunities of Farm Migrant Children*, (Sacramento, California: California State Department of Education, 1971), p. 11, ED-061-006.

98. Ibid., p. 12.

100. National Committee on the Education of Migrant Children "Study Finds Agriculture Still Relys on Child Labor," FOCUS, (occasional newsletter), No. 12, (New York: National Committee on the Education of Migrant Children, March 1971), pg. 1.

101. Ibid., also, reference to Shirley Greene, The Education of Migrant Children, (Washington, D.C.: National Education Association, 1954).

102. Thomasson, 1969, op. cit.

103. National Committee on the Education of Migrant Children, The Educational Problems of the Migrant Child, (mimeographed booklet, N.C.E.M.C., 145, E. 32nd Street, N.Y., undated).

104. Education Commission of the States, Early Childhood Programs for Migrants: Alternatives for the States, (Denver, Colorado, May 1972), p. 30, ED-063-966.

105. Texas Education Agency, Annual Report of the Texas Child Migrant Program 1971-72, (Austin, Texas, Dec. 1972).

106. Texas Education Agency, Texas Child Migrant Program, op. cit.

107. Ibid., p. 16.

108. E. John Kleinert, 1969, op. cit., p. 469.

109. California State Department of Education, 1971, op. cit.

110. Ibid.

111. Gerald M. Jensen, Investigation of Occupational Training Needs of Migrant Workers Which May Point Toward Employment in Other than Migrant Employment, (El Centro, California: Imperial County Schools, 1972), ED-065-262).

112. Ibid.

113. Las Cruces Schools, Project Move Ahead, (Las Cruces, New Mexico: mimeographed, undated), provided by Dr. Alma Barba, Las Cruces, New Mexico. coordinator.

114. Ibid.

115. Ibid.

116. Ibid.

117. Personal interview with Dr. Alma Barba, October 16, 1973, Las Cruces, New Mexico.

118. Palm Beach County Board of Public Instruction, FM Radio: An Oral Communication Project, (West Palm Beach, Florida: 1971), ED-061-739.

119. Ibid.

120. Ibid.

121. Ibid.

122. Ibid.

123. Information obtained via phone conversation with Ms. Pat O'Meara, public relations director, WHRS-FM, Boynton Beach, Florida, December 6, 1974.

124. WHRS/FM, Program Guide (Boynton Beach, Florida: School Board of Palm Beach County, mimeographed 1974).

125. School Board of Palm Beach County, Department of Learning Resources," Audience Survey 1974," (Boynton Beach, Florida: WHRS/FM, School Board of Palm Beach County, mimeographed 1974).

126. O'Meara, op. cit.

127. Office of Migrant Education, Pilot V, (New Jersey Department of Education, 107 W. State Street, Trenton, New Jersey, mimeographed, no date).

128. Personal interview with Ben Fogletto, administrator and Georgianna Badaracca, Curriculum Coordinator, Pilot V, March 29, 1973.

129. Telephone interview with Ms. Geogianna Badaracca, Curriculum Coordinator, Project VI, December 15, 1974.

130. Pilot V, op. cit.

131. Telephone conversation with Badaracca, op. cit.

132. Ibid.

133. Telephone conversation with Ben Fogletto, administrator, October, 1973.

134. M.A. Thesis by Giorgianna Badaracca, information obtained via telephone, December 15, 1974 with Ms. Badaracca.

135. Maxwell Dyer, Children of the Four Winds: The Migrant Student Record Transfer System, Arkansas Department of Education, April 1973, ED-087-456.

136. Ibid.

137. Ibid.

138. Correspondence with Winifred Miller, Administrator, Migrant Student Record Transfer System, Little Rock, Arkansas, April 25, 1973.

139. Ibid.

140. Ibid.

141. Felipe Veloz, *Factors Related to Usage of the Migrant Student Record Transfer System in Five States with High Migrant Concentrations*, (unpublished Doctor of Education dissertation, New Mexico State University, Las Cruces, New Mexico, July, 1973), ED-078-976.

142. Ibid.

143. Ibid.

144. Ibid.

145. Rosemary Gardner and Carolyn Ingram, *The Yettem School Visual Literacy Project; English as a Second Language*, (Los Angeles, California: Teacher Crops, Rural-Migrant, School of Education, University of Southern California, no date), ED-041-257.

146. Patricia Heffernan-Cabrera, and others, *Visual Literacy in the Classroom: The Camera as the Eye of the Mind*, (Los Angeles, California: University of Southern California, School of Education, Teacher Corps, 1971).

147. Ibid.

148. Ibid.

149. Ibid.

150. Frederick Williams and Geraldine Van Wart, *Carrascolendas: Bilingual Education Through Television* (Washington, D.C.: Praeger Publishers, 1974), p. 1.

151. Ibid., p. 12.

152. Ibid., p. 8.

153. Ibid.

154. Ibid., p. 168

155. Personal observation made while employed by New Jersey Department of Labor, 1969, investigating conditions of migrants in New Jersey.

156. California, State Department of Education, Education for Farm Migrant Children, (Sacramento, California, 1971), p. 16.

# CHAPTER V

# EDUCATIONAL COMMUNICATIONS SATELLITE PROJECTS*

## Introduction

The federal government has recognized the potential of applying technology developed for purposes such as space exploration to address, among various concerns, rural education needs and has sponsored a series of satellite-based experiments. The National Aeronautics and Space Administration (NASA) developed and launched a series of Applications Technology Satellites (ATS) in part to carry out such experiments. One such satellite, ATS-1 has been utilized in rural educational experiments in Alaska. ATS-1 utilizes transponders operating in the Very High Frequency (VHF) range and is adequate for voice communications with radio technology. The ATS-6 satellite, launched in May, 1974, is capable of wideband communications needed for television and is now being utilized in several experiments.

NASA has provided the development, construction and launching of these satellites . The ground hardware and the educational development for the satellite education experiments was funded by the U.S. Office of Education until July 1973 when the programs were transferred to the National Institute of Education (NIE). Not only does NIE fund the hardware and educational development but also the production of television programs utilized, and the coordination and utilization activities of the various organizations. (1)

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*Major sources of information for this chapter include: an article by Grayson (2), an article in Broadcast Management Engineering (3), a NASA document (4) and a project description (5)

In this Chapter, several experiments involving ATS satellites are described, with particular emphasis on their utilization in rural areas. The following chapter, Chapter VI, analyzes selected aspects of large-scale telecommunications systems for rural areas.

## ATS-1 Alaskan Village Satellite Project

Alaska with its large land area and isolated communities has had some experience utilizing telecommunications in education on a large scale. A total of 265 rural communities have been identified in Alaska, and of these less than one-third have road and railroad connections. There are 142 villages that have no land link or communication. Radio interconnection via ATS-1 satellite was established with twenty-six locations. Several of these were urban, but they were predominantly isolated rural communities. The ethnic composition of the rural communities is predominantly, and in some cases entirely, Indians, Aleuts, Eskimos, and those from Russian culture background. Linguistically there is much variety with many Native languages and dialects represented in the participating communities. (6)

During the first year of operation, starting October 1971, three major questions emerged: (7)

1. How many hours of educational programming can the village and rural schools effectively utilize?
2. What size and type of village groupings can be accommodated by different types of programs?

3. What kinds of educational programs do the schools and villages really need?

The conclusions which were reached during the second year of operation were: (8)

1. Regarding the number of hours of educational programming which can be effectively utilized: for primary schools, not over one-half hour at one time was found effective; for high school students perhaps one hour and adults much longer. The frequency of airing programs of these lengths that can be utilized was not established.
2. For intercommunications (such as discussions among schools), groups composed of four schools was found appropriate. Much larger audiences can be accommodated with one-way broadcasts.
3. Programs of Alaskan Native culture were found to be relevant. Programming for teacher information and education were definitely found to be successful. A need existed to test the suitability of general parts of the school curriculum for primary and secondary educational levels. It was felt that more programs should be made available to other persons in the community besides students, teachers and health personnel.

It must be remembered when considering the Alaskan experience that the students in the schools involved have had little, if any, exposure to mediated information transmitted via radio and television.

A review of a report of the second year of the project, Village Satellite II, reveals funding, personnel, management, software and technical difficulties. Limited satellite use time and signal quality were also problems. The project was without a project director for half a year, while technical problems included a breakdown of equipment at one school site for the entire school year. Despite these difficulties there was also much enthusiasm generated among teachers, administrators and students involved in the satellite radio project. (9)

One strong indicator of enthusiasm for ATS-1 and the potential of telecommunications technology to augment in-service teacher professional training to rural areas was an NEA seminar held in the spring of 1973. This seminar was accomplished by two-way radio utilizing ATS-1. Spanning a period 16 weeks, the topics presented by various experts, teachers, and consultants included the following: "Open Classrooms in Rural Alaska," "Emerging Trends and Issues in Rural Alaskan Education," and "Effective Teachers of Indian and Eskimo Students." (10) It seems clear that rural Alaskan schools have unique problems that deserve special attention.

Evaluation of the overall ATS-1 experiments in Alaska revealed that the NEA seminar sustained more teacher interest and over a longer period of time than any other element of the experimental program. As one teacher said to the evaluator in an interview, "The satellite radio provided the only professional input to the bush education system." (11)

The cost for the seminar, borne by NEA, was 1,600 dollars, which paid honoraria, secretarial services and the coordinator's salary but none of the satellite costs. One credit of college credit was available for those wishing to enroll and complete requirements.

The report from the seminar coordinator suggested that in such seminars in the future, written material containing the substance of lectures be distributed to participating teachers before the time of broadcast. In this manner, the time "on the air" can be utilized to make the best use of the two-way discussion capability which many of the isolated teachers get little of without the satellite.

The telecommunications experiments in Alaska with ATS-1 brought forth three factors which were deemed critical factors for success: (12)

1. extensive planning
2. involvement of community members and teachers in the planning
3. a sufficient quantity of high quality programs.

## ATS-6 Regional Education Experiments

The latest satellite in the ATS series is ATS-6, presently involved in three educational applications collectively termed the Education Satellite Communications Demonstration. The ATS-6 satellite is unique from other satellites in geosychronous orbit in part because it contains powerful transponders. The 200,000 watts effective power allows for much smaller, simpler and cheaper ground receivers. Previous commercial communications satellites required complex and expensive ground stations. Two earlier NASA satellites, ATS-1 and ATS-3 are not powerful enough to permit television transmissions.

NASA launched ATS-6 on May 30, 1974. The satellite is to remain in geosynchronous orbit 22,300 miles above the equator and 94° west longitude for one year of experiments in the United States.

In May, 1975 the American experiments will end and the satellite will be repositioned for experiments in India.

There are two transmitters aboard ATS-6 which, together, broadcast a 2,500 MHz signal "footprint" on the United States about 1,000 miles from north to south and 300 miles from east to west. (13) The satellite is repointed several times each day to enable various regions to receive transmissions. Each transmitter is capable of broadcasting a quality color TV channel and four audio channels, so that several languages can be broadcast simultaneously or voice or other information can be transmitted, like programmed instruction for example.

In addition to the ATS-6 satellite, ATS-1 and ATS-3 satellites are sometimes utilized in health and education experiments. These earlier satellites are used for voice, facsimile, telegraph and computer data services to compliment ATS-6 capabilities for various experiments. (14)

Earth terminals basically consist of a television receiver, electronic interface equipment to convert satellite signals to conventional television signals, and antenna to receive the satellite signals. There are three types of ground terminals being utilized in the ATS-6 experiments, receive-only, intensive, and comprehensive. (15) The various configurations of these terminals within a project contribute to the individuality of the projects.

The receive-only terminals (ROTs) are the most prevalent and are only capable of receiving signals from the satellite. The equipment costs for these terminals with dish antenna about ten feet in diameter, are, according to a November 1974 report about 4,000 dollars per site plus 1,000 dollars for installation. (16) The next group are the intensive terminals (ITs) which have the added capability, and hardware, to also transmit audio signals. An IT is actually an ROT with the added equipment to send audio transmission via ATS-1 or ATS-3. Total costs for each IT was about 6,500 dollars. The most complex terminals are the comprehensive terminals (CTs) which are only in use in Alaska. The CT is capable of receiving and transmitting audio and video signals. The cost per CT was about 50,000 dollars.

In addition to the ground station receivers and the satellite there are several master up-link transmitters. The Network Control Center for the Health and Education sector has been established with the Federation of Rocky Mountain States in Denver, Colorado with a master transmitter in Morrison, Colorado. The other master transmitter is in Rosman, North Carolina at a NASA facility.

The investment of money on the part of the federal government is in two parts, namely, the educational and ground segment funding, and the satellite development and launch costs. The ATS-6 satellite is estimated to have cost some 180 million dollars for development and 25.4 million for its launch. It is unclear what segment of this cost can be assigned to the education experiments which, with the health related experiments, compose only one component of some twenty-five experiments. (17) The investment that has supported the educational development, operating expenses and ground hardware costs have amounted to 16.7 million dollars from FY 1971 to 1975. (18)

There will be two groups working on the evaluation of the ATS-6 education experiments for a period of two years. The Educational Policy Research Center at Syracuse University will evaluate both the Rocky Mountain and the Appalachia segments. The Alaskan educational experiments will be evaluated by Practical Concepts, Inc. of Washington, D.C., and the Center for Northern Education Research at the University of Alaska.

Grayson reports that included in the objectives of the Education Satellite Communications Demonstration set by NIE for itself are the following: (19)

- To evaluate the feasibility of a satellite-based distribution system for providing needed educational services to isolated rural populations;
- To test and evaluate, using a variety of instructional materials, the degree to which the intended audiences accept this service, and determine the cost of various ways to deliver those services; and
- To determine the most effective organizational arrangements for developing and using complex technologies in education.

Grayson advances that, "Although the three regional projects differ in course material, audience, instructional approaches, and organizational arrangements, they share the same goals." (20)

Alaskan ATS-6 Education Experiments. Alaska is committed to improving telecommunications for citizens of the state. The Alaska ATS-6 experiments are under the supervision of the Office of Telecommunications in the Office of the Governor. Of the three

ATS-6 large scale experimental education projects, Alaska is unique in that is has had prior experience with satellite telecommunications.* Because of Alaska's commitment to telecommunications, in some form, the ATS-6 experiments are designed to explore more the ways of using existing techniques and technology rather than in precisely measuring the instructional efficiency of various techniques. (21) "Demonstrations will serve as models for services which might be made available on an economically feasible basis in the future." (22)

The signal pattern of the ATS-6 satellite limits the coverage available to Alaskan communities. The western and northern perimeter will therefore be excluded. The communities selected to participate in the experiment number seventeen of which thirteen are inhabited predominantly by Eskimos, Aleuts, and Indians while the remaining four; Fairbanks, Juneau, Petersburg and Valdez are urban. The communities are virtually the same as those participating in the ATS-1 experiments. Thirteen languages or dialects are represented in the thirteen rural locations.

The Alaska segment of the experiments has been allotted four hours and forty minutes of satellite time per week. (24) Two major divisions of the experiments are a) Instructional Programming directed at schools and b) Public Broadcasting. The Instructional Programming segment is directed towards Basic Oral Language Development, Health Education, and Teacher In-Service Training. (25) Each Alaskan earth terminal is an Intensive Terminal and thus enables the entire Alaskan project to utilize two-way audio communication (via ATS-1 satellite). It is planned that health education will consist of sixty-four programs, thirty minutes each; thirty-two programs in basic oral language development, and thirty-two teacher training sessions. (26) Most programs have built-in pause points for viewer audio response. (27) The Northwest Regional Education Laboratory is responsible for the design and development of the instructional programs and the University of Alaska is handling the television production.

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*Hawaii has also had experience but is not included in the ATS-6 educational experiments. For a discussion of the Hawaiian experience, see reference (23).

Teachers have received manuals for each of the instructional program areas. These manuals include not only program goals and objectives but a description of program content, lesson guides, and teaching activity suggestions including: lesson preparations, viewing and interaction, follow-up activities and evaluation. (28) Overall direction for the instructional programs comes from committees which are composed of village representatives, Native leaders and state education agency representatives. (29) There is a committee for each of the major subject areas. (30)

The Public Broadcasting section features a series entitled "Alaska Native Magazine" which presents the audio section in several Native languages besides English. The Instructional Programming section faces language difficulties as each of the thirteen Native villages in the project use a different language or dialect. (31)

The Alaska project thus deals with some villages that previously had no television, with predominantly Indian, Aleut and Eskimo populations, and with very isolated areas. There is some continuity because these 13 villages have previously utilized satellite relayed telecommunications, and thus needs are being more clearly articulated with continued experience. The high percentage of Native inhabitants in the rural areas has not been neglected. Oral language development, special health problems and programs of Native interest are key features.

In the words of Grayson about the Alaska project:

> "Experiments are being conducted to improve effectiveness, assess user acceptance, and determine the value of the techniques for operational applications. Data are being developed on potential demand, user acceptance, operating costs, and possible operating problems." (32)

Appalachian ATS-6 Education Experiments. The Appalachian area ATS-6 experiments have been developed by the Appalachian Regional Commission (ARC) in a project entitled the Appalachian Education Satellite Project (AESP). The ARC conducted a survey of over 32,000 Appalachian school teachers and based on the survey identified in-service training as the major need of the area. The AESP then decided to concentrate on reading instruction and career counselling as the areas of emphasis for in-service training to be conducted via satellite. (33)

The ARC subcontracted with the University of Kentucky for course development and television production and selected fifteen Regional Educational Service Agencies (RESAs) for utilization activities. The RESA network had been established at an earlier date by the ARC to serve Appalachian teachers. The role of the ARC is one of supervision and coordination. The University of Kentucky serves as the Resource Coordinating Center for the project. (34)

The AESP experiments were divided into two segments chronologically as well as in terms of content. The first segment was conducted during the summer, starting in July 1, 1974. For this portion some 600 elementary school teachers were offered two graduate-level courses, one in career education and the other in elementary reading. Credits were available from one of twenty-two participating colleges for those successfully completing the course series. Each course was composed of four 45-minute live video seminars and twelve 30-minute video programs (pre-taped). The seminars had provision for two-way audio interaction and the pre-taped programs were each followed by fifteen minutes of programmed instruction which utilized the four audio channels in a question and answer series. During this interaction phase a presentation would be given and the teachers would be asked to respond to multiple choice questions by pressing one of four response buttons and receiving, in turn, an audio message related to his or her answer. During the school year (1974-75) the teachers completing the courses should be able to: a) teach other teachers in their districts the same skills, b) introduce career education in their skills, and c) diagnose and deal with student's reading problems. (35)

In-service training courses in both reading instruction and career education are being offered via ATS-6 during the 1974-75 school year. The course in reading is targeted for teachers of elementary grade students while the career education segment is targeted for high school teachers. The courses consist of twenty-six 45 minute live video seminars with provision for audio interaction.

These courses are relayed via satellite to RESA centers after school hours. (36)

For this school-year segment the fifteen RESAs are grouped into five groups of three each. Each of the five groups is composed of an Intensive Terminal (IT) with two Receive-Only Terminals (ROT) complementing. The two ROTs in each group are connected by telephone lines to their respective IT terminals so that two-way communications can be facilitated for all teachers participating. Broadcasting originates from the Resource Coordinating Center in Lexington, Kentucky and sent via video land lines to the NASA facility at Rosman, North Carolina where the signals are relayed via ATS-6 to participating RESAs.

Supplementing the two-way seminars is a computer based information system. Requests for information from teachers are sent by phone to the main RESAs and from there via ATS-3 to the University of Kentucky, where they are fed into a computer. Printouts of computer responses to the information provided about students (such as the child's age, reading level and reading habits) are sent to the requesting teachers by mail. Additionally, some telecopying via satellite is done for some printed materials and administrative memoranda. (37)

The Appalachian experiments are taking place in Alabama, Maryland, New York, Virginia, Tennessee, West Virginia, North Carolina and Pennsylvania. The Combined summer and school year projects have reached some 1,200 teachers. In addition to the teachers directly involved with the satellite delivered programs, some 20,000 additional teachers may be reached through replays of videotapes, over public broadcasting systems, according to reports from the ARC. (38) Evaluation of this regional experiment should indicate how effective a planned regional system for in-service teacher training utilizing satellite telecommunications can be.

Rocky Mountain ATS-6 Educational Experiments. The ATS-6 experiments in the Rocky Mountain region are under the direction of the Federation of Rocky Mountain States, Incorporated, (FRMS), which was established in 1966 as a partnership of six mountain states (Idaho, Montana, Wyoming, Utah, Colorado, and New Mexico). They have developed a large scale satellite based educational telecommunications demonstration project, utilizing the ATS-6, called the Educational Technology Demonstration (ETD). The ETD project is serving non-member states of Nevada and Arizona. (39) The Rocky Mountain area is one of severe isolation and within the borders live 30 percent of both this country's Spanish surnamed and Indian populations. (40)

The main thrust of programs in the ETD is career education targeted generally to students aged ten to seventeen, or junior high school youth in particular. Weekly in-service teacher training, community programming and a materials distribution project compose the other portions of the Rocky Mountain experiments.

The prime target group in this series of experiments is reached through fifty-six school locations throughout the Rocky Mountain states. A review of the communities that are among the target reception points of the ETD project show 18 community populations totalling below 1,000, with the lowest having a population of thirty residents. Among the fifty-six target communities are three with populations over 5,000, the highest having a population of 7,995. The total primary target audience consists of about 6,200 students attending school at the fifty-six reception points. (41) Thus, there is an average of 110 elementary participants per reception point, but review of the 56 school populations reveals less than 15 schools with over 100 students, clearly a rural education target audience. Regarding the ethnic composition of the target audience there is approximately 10 percent Indian and 10 percent Spanish surnamed students in the satellite demonstration audience.

The network configuration involves a central distribution point located at the FRMS headquarters in Denver, where programs are developed, produced and coordinated. The programs are broadcast via the ATS-6 satellite in a beam that covers about half of the Rocky Mountain area. Then, each day, the satellite is repointed so the beam will cover the rest of the states and the programs are repeated. Within each state are seven main reception points with three of the seven terminal points in each state being Intensive Terminals (ITs). Students at IT sites can have two-way audio communication with the program origination point in Denver and with participants at the other IT sites in their footprints. The two-way capability, a key feature of the project, utilizes the ATS-3 satellite for transmitting the signals from the twenty-four Intensive Terminals. The remaining thirty-two school contact points are ROTs and only receive the television media programs. Additionally, the satellite transmitted materials are received by twelve of the thirteen public broadcast television stations in the region, two cable systems and two translaters. (42)

An average of about fourteen and a half hours per week are allocated to the Rocky Mountain experiment, but any one location will only receive just over seven hours as everything is broadcast twice due to the daily repointing. The series, "Time-Out" targeted for the junior high audience consists of eighty-one shows totalling some 121 hours of programming. The "Time-Out" series on career education is a combination of specially produced video-taped programs, live broadcasts and existing video materials. The twenty-four Intensive Terminal sites are equipped to enable students and teachers to respond during certain segments of the programmed material, and to also communicate with participants at other intensive terminals within their footprint during the live broadcasts. (43)

The "Time-Out" series is broadcast each school day in thirty-five minute shows, with six minutes per show allotted to two-way interaction. These programs cover three areas of career education: (a) self-assessment (b) career exploration, and (c) decision-making. Two of the weekly broadcasts contain core content material; two programs contain material to support, enrich and reinforce the objectives. The fifth day of each week is scheduled for two-way audio interaction. (44)

Approximately 600 teachers are given the in-service training series entitled "Careers in the Classroom", via satellite in a video format. The programs, sixteen in all and lasting fifty-five minutes each, are viewed at the end of the school day. There were, additionally, some pre-service training broadcasts before the start of the 1974-75 school year for site coordinators and career education teachers.

Because career decisions effect others in the community such as parents and interested professionals, the programs are also made available to participating public television stations and cable systems. There is a special series that is targeted for adults in isolated rural communities entitled "Footprints." This series is broadcast on Thursday evenings at three week intervals and deals with topics deemed of interest to adults in the informationally isolated areas and of specific concern to those living in the region.

Two hours of broadcast time of each week (in each footprint) in the Rocky Mountain Satellite Technology Demonstration are used for a video materials distribution service. A catalog listing the 400 videotaped programs available to all Intensive Terminals has been distributed to teachers at schools involved in this part of the experiment. The topics cover subjects such as language arts, fine arts, science, health, and so forth. Once a teacher selects a program from the catalog the request can be forwarded to Denver by ATS-3, telephone or mail. The video material is later transmitted via ATS-6 and can be received by all ITs and can be videotaped at those schools wishing to utilize the program at a later date. (45)

## Summary and Comments on ATS Education Projects

Three regional education experiments in Alaska, the Rocky Mountains and Appalachia are presently underway. Satellite relayed television is the core and common element of these projects supported jointly by NASA and NIE. All three projects reach rural audiences but each region is addressing slightly different aspects of the rural education need spectrum. Each regional experiment is developing and producing its own materials and television programs to some extent. Organizational and technical systems are being tested as well as various educational criteria, target audience approaches and achievement goals.

The Alaskan experiments clearly address not only rural education but also diverse, rurally isolated ethnic groups. The target audience of the Alaskan programs is almost exclusively rural. The ATS-6 experiments include a section addressing oral language development and could thus be said to be addressing core elementary school curriculum. In addition, the Alaskan ATS experiments are addressing teacher and parent audiences, which may be a necessity for success of telecommunications projects in such isolated areas. Because of the state's commitment to telecommunication and because of the affiliation with the Office of the Governor, Alaska's future with telecommunications in rural education, in some form, seems quite secure.

The Appalachian experiments, although not directly addressing rural students, are concerned with areas relevant to rural education. First, the organization of the RESAs (Regional Educational Service Agencies) created by the Appalachian Regional Commission is being strengthened, or at least being functionally utilized. The ATS-6 experiments should reveal, at least to some degree, if the in-service training of rural teachers can be accomplished on a cooperative basis crossing state lines and outside the traditional university classroom setting. The experiments should indicate the impact of the teachers' training by change in student performance.

The Rocky Mountain ATS education experiments have the largest network, in terms of equipment. Addressing rural audiences, the

Rocky Mountain experiments are concentrating on an area of education, career education, which had previously been badly neglected in this rural region. Teacher training and informational materials, two other general weaknesses of rural education have also been chosen to be addressed by the Federation of Rocky Mountain States. The organization structure being tested differs from the Appalachian area in that a more hierarchical system exists in which the Federation serves both as the link with the states and jointly with the states as the link with the target communities. By comparison, the Appalachian area has decentralized, sub-regional agencies.

Overall the most neglected area in the ATS education experiments reaching rural populations is core curriculum material.* Another unfortunate aspect of the experiments is the limit of time that has been allotted to educational use. It seems a sizeable task to evaluate the overall effectiveness of large-scale projects such as these ATS experiments, based on such limited usage by the target audiences.

The hardware and organizational structures being tested through the ATS experiments are in a better position to be evaluated fairly than the costs or the software elements. Further experimentation that would allow testing of large-scale education telecommunications systems with more reception points, more students and more software seems warranted.

The future of large-scale satellite-based educational telecommunications experiments is very uncertain. One possibility for

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*The author does not include career education, a major focus for the experiments, in the "core curriculum" category.

for future utilization is the Communications Technology Satellite (CTS) a joint United States - Canadian* project scheduled to be launched in December, 1975. (46) NASA, which is evaluating United States submitted proposals for experiments, has given conditional approval for the Federation of Rocky Mountain States to carry out further experiments on CTS based on their ATS-6 involvement. (47) Thus at least one rural-related experiment may continue, although some modification in ground equipment will be required because ATS-6 and CTS transmit at different frequencies.

Beyond CTS, however, are only commercial satellites which, in the main, are low powered and demand expensive ground equipment which may preclude any meaningful rural satellite-based education projects due to prohibitive costs. Efforts are underway to try to stimulate future development of satellites for public service uses through the formation of a Public Satellite Service Corporation. (48) Among the options to be considered are using ATS-6 after its deployment for a year in India. However, should all efforts fail to stimulate continued interest in large-scale, satellite-based, rural education projects, then only medium or small-scale projects may be within the reach of rural populations in the near future.

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*This thesis has not examined Canadian experience with satellites for rural education and development, some of which may be relevant.

## FOOTNOTES

Chapter V

1. Lawrence P. Grayson, "Educational Satellites: The ATS-6 Experiments," The Journal of Educational Technology Systems (November, 1974).

2. Ibid.

3. "Interactive Satellite: ATS-6 Brings People Together," Broadcast Management Engineering (BME), (November, 1974) pp. 30-44.

4. "Health-Education Telecommunications Experiment (HET): Experiment Summary Description," (Washington, D. C.: Department of H.E.W. and N.A.S.A., November 1, 1973).

5. Goodbye to the Great Divide, (Denver: Federation of Rocky Mountain States, Inc., 1973).

6. Walter B. Parker, Village Satellite II: The Second Evaluation of Some Educational Uses of ATS-1 Satellite Education Broadcasting in Alaska, (3724 Campbell Airstrip Road, Anchorage, Alaska 99504, July 1973).

7. Ibid.

8. Ibid.

9. Ibid.

10. Ibid.

11. Ibid.

12. Kenneth A. Polcyn, An Educator's Guide to Communication Satellite Technology (Washington, D. C.: Information Center on Instructional Technology, Academy for Educational Development, Inc., 1973), quoting from: Alaska Educational Broadcasting Committee, A Proposal to Develop a Plan for Unique and Innovative Education Demonstrations in Alaska Employing ATS-F, a proposal submitted to The Department of Health, Education and Welfare, April 21, 1972.

13. Grayson, op. cit.

14. Ibid.

15. Ibid.

16. Ibid.

17. Ibid.

18. Ibid.

19. Ibid.

20. Ibid.

21. Ibid.

22. Broadcast Management Engineering (BM/E), November, 1974, op. cit.

23. Robert P. Morgan and others, Large-Scale Educational Telecommunications Systems for the U.S.: An Analysis of Educational Needs and Technological Opportunities (St. Louis, Mo.: Center for Development Technology, Washington University, forthcoming).

24. BM/E, op. cit.

25. Grayson, op. cit.

26. Ibid.

27. BM/E, op. cit.

28. Grayson, op. cit.

29. Ibid.

30. BM/E, op. cit.

31. Grayson, op. cit.

32. Ibid.

33. BM/E, op. cit.

34. Grayson, op. cit.

35. Ibid.

36. Ibid.

37. Ibid.

38. Ibid.

39. Goodbye to the Great Divide, (Denver: Federation of Rocky Mountain States, 1972) op. cit.

40. Ibid.

41. Material supplied by Louis Bransford, Director of Utilization, Federation of Rocky Mountain States, personal interview, Denver, October 1973.

42. Grayson, op. cit.

43. Ibid.

44. Ibid.

45. Ibid.

46. Robert P. Morgan and others, op. cit.

47. Ibid.

48. "Public Service Satellite Consortium Formed," Joint Council on Educational Telecommunications News, Special News Release, January, 1975.

## CHAPTER VI

## ANALYSIS OF SELECTED ASPECTS OF RURAL EDUCATIONAL TELECOMMUNICATIONS

### Introduction

In this chapter, several aspects of rural educational telecommunications are analyzed. Included in this analysis are considerations of costs and organizational structure. The costs of establishing and operating several telecommunications networks for rural education will be roughly estimated, using information developed in this report and from other sources. Organizational structures of telecommunications systems are also discussed. These structures must be sensitive to the various parameters of rural education to be effective. Emphasis is placed upon large-scale projects employing communications satellites although some consideration is given to smaller scale projects.

A large-scale rural educational telecommunications system is defined in this investigation as a network utilizing some form of electronic technology that interconnects schools, or other educational institutions, over a region of several states or as large as the entire nation. A small-scale system would be defined as a one or two school radio project, for example. In between would be intermediate-scale projects such as Program VI which involves six schools, but in only one state. By contrast, movie projectors, tape recorders* and similar technology utilizing miscellaneous, piece-meal material might be classified audio-visual aids.

## Costs of Large-Scale Telecommunications for Rural Education

A Simplied Model for Costing. The total cost for a large-scale educational telecommunications project may consist of some or all of the following component costs:

Research and Development
Hardware purchase costs
Hardware installation, operation, servicing, etc.
Software development costs (research, writing, production)
Software purchase or rental fees
Salaries of project directors, technicians, etc.

There have been few, if any, detailed studies of costs of large-scale educational telecommunications systems for rural education. In this study, the author has not attempted to perform a detailed cost analysis for such systems. However, it is instructive to do some approximate calculations to illustrate order-of-magnitude costs for such systems.

To a first approximation, the total annual costs of such a system may be expressed as follows:

$$T = D + R + S \qquad (1)$$

where: $T$ = Total Costs

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*A system or network might be created by mailing of video-tapes.

D = Distribution Hardware Costs; (e.g. Costs of Satellite Channel Rental)

R = Receiver Hardware Costs

S = Software (Programming) Costs

In the illustrations to follow, consideration will be restricted to television distribution without audio or visual feedback. More detailed analyses have been undertaken by Hupe of television with feedback (1), by Stagl et. al. (2), and by Morley (3) of delivery of computer-aided instruction to rural areas.

Receiver hardware costs may be expressed as:

$$R = C_t n_t S \tag{2}$$

where $C_t$ = Annual cost per ground terminal in dollars

$n_t$ = Number of ground terminals per school

$S$ = total number of schools

In what follows, one ground terminal per school will be assumed. This assumption neglects potential costs to local schools of having to buy more than one television set or of having to wire the school. Also, distribution to non-school sites (e.g. homes, community centers) is not considered. Experience in the ATS-6 experiments has indicated receiver costs of about 5,000 dollars, installed. This will be annualized at 1,000 dollars per year, per site.*

Distribution hardware costs are given in this simplified analysis by:

$$D = C_s N_c H \tag{3}$$

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*Hupe's analysis indicates annual receiver costs of 960 dollars for less than 1,000 units and 450 dollars above 1,000 units. (4)

where $C_s$ = satellite channel cost, in dollars per channel-hour

$N_c$ = number of channels

$H$ = hours used per year

In what follows only one satellite channel will be assumed. Satellite channel rental costs of 600 dollars per hour have been cited previously by Hupe (5) who has more recently quoted a figure of 1,000 dollars an hour (6) for a 2.5 GHz high-powered satellite of the kind suitable for rural areas.

Programming costs may be expressed as:

$$P = C_p h \tag{4}$$

where $C_p$ = program production costs in dollars per hour of programming

$h$ = hours of programming produced per year

Software costs seem to vary over a wide range based on experience from projects and public television experience. The cost of software for nationally distributed programming on public television averages 40,000 dollars per hour. Sesame Street is said to cost about 60,000 dollars per hour while "World Press Review" costs only 4,500 dollars per hour. (1) Yet, "A simple televised, lecture can be produced for as little as $50 an hour, while a presentation making use of film and other visual materials might cost as much as $6,000 an hour." (8)

Software costs in television or videotaped projects that have been reviewed in this report were within the range noted above. Project VI cost 536 dollars per minute or about 30,000 dollars per hour to produce videotape lessons. (9) The Rocky Mountain educational portion of the ATS-6 experiments consists of some 500 hours of broadcasting during the year averaging a cost of over 17,500 dollars per hour. (10)

It is not clear which cost factors of program production are most significant in relation to rural education. Quality, sophistication, technical features and reuse of programs, all effect the cost. In the following calculations 20,000 dollars per hour will be used as an estimate. Variations from this would no doubt occur in an actual project.

Substituting expressions for P, D and R (Equations 2-4) into equation (1) yields the following equation for total annual costs:

$$T = C_s N_c H + C_t n_t S + C_p h \qquad (5)$$

Useful expressions for annual costs per student, $T_s$, and costs per student-hour, $T_{sh}$, are given by:

$$T_s = \frac{T}{N} = \frac{C_s N_c H + C_p h}{N} + \frac{C_t n_t S}{N} \qquad (6)$$

where: N = total number of student users and

$$T_{sh} = \frac{T}{NH} = \frac{C_s N_c + C_p f}{N} + \frac{C_t n_t S}{NH} \qquad (7)$$

where $$f = \frac{h}{H} = \frac{\text{hours of programming produced per year}}{\text{hours of programming used per year}} \qquad (8)$$

In this simplified model, a utilization factor f equal to one will be assumed although f will be less than one if programs are reused to some extent from year to year. It is also assumed that one satellite channel is available for rental; therefore $N_c = 1$. Equation (6) then becomes:

$$T_s = \frac{(C_s + C_p)H}{N} + \frac{C_t S}{N} \qquad (9)$$

In the illustration calculations to follow, $C_s$ = \$1,000, $C_t$ = \$1,000 and $C_p$ = \$20,000. Therefore, Equation (9) becomes:

$$T_s = \frac{(21,000)H}{N} + \frac{(1,000)S}{N} \qquad (10)$$

Illustrative Systems. In order to give some examples of costs, four hypothetical systems have been developed. The systems are summarized in Table 39 and results of cost calculations are shown in Table 40. The systems examined are as follows.

Illustrative System A is composed of 125,000 students located at 400 school sites. This system size was determined by taking the approximate number of rural Indian students. The 400 schools were assumed to be composed of the 200 Bureau of Indian Affairs run schools and 200 other rural schools with large Indian enrollments. Perhaps some consortium would coordinate and produce the programming of interest to rural Indians, mostly on reservations. System A was assumed to broadcast one hour per day of programming, five school days per week and running for thirty weeks totalling 150 hours per year. The cost per student in such a system is estimated to be 28 dollars per year. This total consists of three dollars of fixed cost for the receiver equipment and an estimated 25 dollars for the 150 hours of programming. This cost seems nominal when viewed in relation to the annual federal expenditure for Indian education; 400 dollars per student for those receiving Johnson-O'Malley and P.L. 874 (11) support up to about 2,000 dollars per student in B.I.A. run schools. (12)

Illustrative System B is composed of 600,000 students located at 1,200 school sites. This system size was determined by taking the approximate number of rural public school students found in the eight

Table 39

### ILLUSTRATIVE SATELLITE-BASED TELECOMMUNICATIONS SYSTEMS FOR RURAL EDUCATION

| System | Number of Students | Number of Schools | Comments |
|---|---|---|---|
| A | 125,000 | 400 | Corresponds to Rural Indian Student Population |
| B | 600,000 | 1,200 | Corresponds to Rocky Mountain Region Student Population |
| C | 350,000 | 5,000 | Corresponds to Nationwide Migrant Student Population |
| D | 13,000,000 | 28,000 | Corresponds to Entire U.S. Rural Student Population |

Table 40

### RESULTS OF COST CALCULATIONS BASED ON ILLUSTRATIVE SATELLITE-BASED TELECOMMUNICATIONS SYSTEMS FOR RURAL EDUCATION*

| System | Number of Students in System | Number of Schools in System | Hours of Programming Per Year | Yearly cost per student |
|---|---|---|---|---|
| A | 125,000 | 400 | 150 | $28.00 |
| B | 600,000 | 1,200 | 750 | 28.00 |
| C | 350,000 | 5,000 | 300 | 32.00 |
| D | 13,000,000 | 28,000 | 2,000+ | 6.00 |

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*These results assume: Annual ground receiver cost of $1,000; satellite rental cost of $1,000 per hour; Programming (software) cost of $20,000 per hour; one receiver per school.

+This would necessitate two one-way channels and would require modification of ground receiver hardware. The cost for this alteration is assumed to be relatively low and therefore not added to the yearly receiver cost.

states of the Rocky Mountain region. This system is assumed to be the size that a regional group might organize. Hypothetical System B was assumed to broadcast five hours per day of programming, five days per week and running for thirty weeks totalling 750 hours per year. The cost attributable to one student in this system is estimated to be 28 dollars per year. This total consists of 2 dollars of fixed costs for the receiver hardware and 26 dollars for 750 hours of programming.

Illustrative System C is composed of 350,000 students located throughout the country at 5,000 various rural school sites. This system was determined by taking the approximate number of rural migrant students and the schools they attend. System C was assumed to broadcast two hours per day of programming, five school days per week and running for thirty weeks, totalling 300 hours per year. The costs attributable to one student in such a system is estimated to be 32 dollars per year. This cost total consists of 14 dollars of fixed costs for the ground receiver hardware and 18 dollars for the 300 hours of programming. The receiver costs are higher than the other systems because of the relatively low number of assumed migrant users per school.

Illustrative System D is composed of 13 million students located at 28,000 rural school throughout the country. This System size was determined by taking the total number of rural public school students in the United States and the estimated number of schools they attend. Hypothetical System D was assumed to broadcast about seven hours of programming per day on two channels, five days per week for thirty weeks, totalling 2,000 hours per year. The average cost attributable to one student in this system is estimated to be 6 dollars per year. This total consists of 3 dollars of fixed costs for the receiver equipment and 3 dollars for 2,000 hours of programming.

Discussion and Limitations of Cost Analysis. The calculations summarized in Table 40 illustrate that per student costs may be relatively low compared to total expenditures per-student. However, they were arrived at based upon several simplifying assumptions. They do not include considerations of costs of interactive (two-way) services which Hupe has shown to be significantly greater than for one-way television distribution. (13) They do not address the issue of the mechanisms by which a satellite channel might be made available at 1,000 dollars an hour when such a service is not presently available. Although the per-user costs in satellite systems tends to fall as the number of users increase, these calculations do not consider the difficulties associated with funding a large-scale system. Nor has consideration been given in these calculations to the difficulties of developing programming suitable for large-scale audiences in many states, cultural and language speaking groups.

Considerations of local conditions are another area omitted from the calculations. No comparison is offered between cost-effectiveness of large-scale versus small-scale systems. No consideration has been given to the cost of a mechanism to ensure local control of programming. Other locals costs such as additional television receivers and wiring to other viewing sites are not considered.

This cost exercise has been undertaken to obtain an order of magnitude of costs of large-scale systems. More careful and detailed cost studies which yield accurate cost figures are needed by groups contemplating such efforts.

From the preceding calculations it can be estimated that the range of costs attributable to one student in a rural area might range from a low of 5 dollars per year in a large user system to a high of about 35 dollars per year in a smaller system. Another way to view these costs is to consider the average per-hour costs which were less than one cent per-hour in System D*, the hypothetical nationwide system to about 20 cents per-hour in System A, the smallest of the large-scale systems considered.

Variations in software, or programming costs have certain effects. A halving or doubling of average hourly programming costs would significantly alter the yearly per-student costs. Larger audience systems, although less sensitive to variation in programming costs, still reflect programming costs as the major portion of the yearly cost. Thus when considering programming costs both the cost per hour and the size of the user-audience have an effect on the yearly cost. Total per student costs are sensitive to program production costs and program utilization. If programs can be reused year after year or shown more than once a year, total per student costs can be reduced markedly.

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*Since a typical student would not view all of the programs broadcast the cost per contact hour would probably be closer to four cents.

These cost discussions have been based on the assumption that a technology will be utilized that is not restrained or limited by earth bound communication costs such as telephone lines. Thus, without the secure future of a high-powered satellite or the location of rural schools within the reach of traditional broadcast facilities, the additional costs of relaying electronic signals would have to be considered.

It has been assumed in these cost calculations that the receiver would be located at the school. It has further been assumed that some method of distributing students and televisions within the school can be resolved at each school site. Telecommunications offers the potential of reaching students at their homes, but this has not been considered here. This study does not consider the costs of a community reception center affiliated with the school. Certain local costs including additional televisions, distribution lines, and so forth may arise, which have not been considered in this study, but may be of major significance in the total cost per student.

Several factors arise in rural education that must be considered in addition to the total amount of money expended or the cost per student. Certainly both the hardware and software costs have bearing on the per-user cost depending on the size of the system. Beyond that, a rural school must question expending any additional money from its already small resources. There is no clear indication of who would pay for a large-scale system for rural users. Perhaps the federal government would aggregate an educational user market, rural and urban, and fund a large-scale system. Perhaps some cost-sharing system such as was utilized by the phone companies would be implemented. Determining who pays which costs may be crucial to implementation of a large-scale telecommunications system.

Rural educators need to consider the benefits that could arise from participation in a telecommunications network in terms of educational quality. If programs via a telecommunications network can in fact improve the education of students in a given rural school, even at three or four dollars an hour, it may be worth the money if no other means are available, short of relocation, to upgrade the curriculum. In rural areas, costs may well not be the crucial deciding factor in bringing about, or hindering, the development of large-scale educational telecommunications systems.

The potential exists for "special groups," such as Indian students to lead the way in establishing telecommunications networks. This potential exists in the Indian case because of commonality of interests and because they are largely educated through federal funding schemes which could potentially be moved in the direction of telecommunications aided instruction.* If a network were in existence that could reach all schools, the development of one or more centers to research and produce special interest educational software becomes feasible, as the cost per student becomes reasonable.

## Organizational Structure

An organizational structure tends to embody not only the hierarchical aspects of an organization but also its functional characteristics in respect to its legal, philosophical and financial settings. The structure for an organization of school districts covering any large area, especially crossing state boundaries, is a very significant factor in order to achieve efficient functioning for a common goal such as the delivery of educational material via telecommunications.

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*Problems of language diversity should not, however, be slighted.

The legal and administrative configurations of schools in the United States present certain parameters which must be acknowledged in the design and functioning of any inter-school organization desiring success. The states are legally responsible for education and they in turn have given the individual school districts a great deal of autonomy. The people on the local school boards are not specially trained in education or administration and their precedent has been one that has exhibited very little cooperation with organizations outside the state body to which they are legally responsible.

For production and delivery of mediated programming, what appears to be needed, short of the private textbook supplier model is an organization that allows education institutions to maintain control yet remain flexible and provides enough benefits, such as specialized programs, to warrant participation by the schools. Thus an organization larger than the separate schools could offer centralized program development and dissemination so that individual school personnel could concentrate on their more important functions of teaching.

What seems to be needed organizationally is probably some regional centers something akin to the Regional Education Laboratories but under the control of the states rather than the federal government. What this type of organization would promote is cooperative educational efforts that would not deny each state their individual decision making rights but would still permit endeavors on a larger scale than would be feasible by individual states, and would possibly result in less expensive per-student costs than if such programs were developed independently. The number, location and emphasis of such regional and national educational coordinating bodies would very, no doubt, according to needs of the respective groups.

A study by John Walkmeyer (14) has delved rather extensively into alternative administrative frameworks for educational satellite systems. One hypothetical program put forth by Walkmeyer would address rural areas through a satellite-based expanded public broadcasting distribution system. The idea is that this hypothetical system would be owned and operated by the Public Broadcasting Service*. The proposed system would use two to four channels, three regional and one major satellite broadcast stations and 13-15,000 ground terminals. This expanded network would be designed to carry out the two objectives of increasing the coverage to rural areas and to also deliver instructional programming to rural areas. (15)

To accomplish these objectives Walkmeyer advances an evolutionary administrative structure for this project. Initially a separate board would be established within the PBS structure and composed of members from the public broadcasting community. Eventually, the plan calls for the board to be dominated by non-PBS users of the PBS-owned satellite-linked system.

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*Currently the major distribution service for nationally broadcast public television.

What Walkmeyer has depicted is a nationwide organization structure for satellite-based television distribution to rural areas using a public corporation with strong federal backing. In another scenario he portrayed a hypothetical "National Satellite and Educational Telecommunications Coordinating Entity" which may well be needed to coordinate rural oriented organization activities with other non-rural educational users of satellites. (16)* At this juncture it is not clear how many regional based organizations would be necessary for optimum use patterns in addition to, or in place of one or more nationwide organizations. It is possible that the near future will witness development predominantly of regional telecommunications-based educational organizations.

## Smaller-Scale Telecommunications Alternatives

Large scale telecommunications systems offer low user costs when a large audience can be assembled, but high initial capital costs. On the other hand low initial cost is available with some smaller scale systems. One alternative is radio technology which is cheaper than television and has been utilized in some projects in rural areas. The Ramah Radio project cost about 20 dollars per hour to run. A more organized, rigorous use made of the visual aids or videotape recorders similiar to Program VI where videotapes are the core of a planned, sequential curriculum supplemented with other materials would be an example of a smaller scale system, but costs can become high per-user, despite lower capital costs.

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*A nationally oriented organization, the Public Satellite Service Corporation (PSSC) was formed early in 1975 (19). It is not yet clear if it will serve the function Walkmeyer has specified.

Another idea advanced is the use of low power television. Bourrets (18) suggests a configuration utilizing 100 to 1,000 watt transmitters which can cover a 15 mile radius with television signals. A mini-station costing 12 to 15,000 dollars would serve schools within the 15 mile radius. Then 12 or more mini-centers would be affiliated with a program center costing about 30,000 dollars. The program center would be responsible for developing educational program material and distributing it to the mini-stations for rebroadcasting. Including in the design are televisions with 23 inch screens costing 200 dollars apiece and 300 watt generators at 100 dollars apiece to power the television in remote locations. This idea is supposedly inexpensive enough to be owned by local constituents. (19)

The low-cost, low-power telecommunication configuration such as advanced by Bourret may be feasible for large Indian reservations and areas where rural schools are in close proximity. However, reviewing the rural public school pupil density per square mile indicated in Figure 1 shows that certain geographic areas contain physical barriers of distance. Alaska and the Western states having densities of less than 4 students per square mile which may be too sparse to support ideas like Bourrets'.*

These are many examples of projects in rural education that utilize resource sharing concepts, sometimes in conjunction with telecommunications technology. In Mississippi, a mobile trailer was utilized at 7 sites to enable 125 adults to take adult education courses in one year. (20) In Colorado, a seven channel audio-tape deck and headsets were installed in the rural school buses so that students could listen to educational programs while riding to and from school. (21) Commercial television was utilized by the Appalachian Education Laboratory to broadcast daily pre-school education to the homes for viewing by mother and child. (22) Another Colorado project featured lectures by telephone to schools up to 265 miles away using phone amplifiers in the classroom. (23) A mobile van equipped with C.A.I. equipment was used to teach teachers in Pennsylvania and allow them to earn college credit. (24)

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*There is also some question concerning the availability of such equipment.

Various resource sharing techniques are available to rural schools. Further research appears needed on the benefits and costs of the various resource sharing techniques for rural education, as telecommunications is only one method of helping to achieve such goals. Included in such studies should be trade-offs between transportation and telecommunications. Beyond a certain point of travel it would seem that telecommunications would be more cost-effective.

## Summary and Conclusions

Based on costs generated from the ATS-6 experience and from other sources, calculations were made using a simplified equation to derive the yearly per-student costs of participation in a large-scale rural telecommunication network. In developing the costs hypothetical cases were used that closely match the real population configurations in rural areas. Four systems were developed that would address a group the size of 1) the rural Indian school population; 2) the migrant student population; 3) a region of the United States, corresponding to the rural student population of the Rocky Mountain region, and 4) the entire rural school population of the United States. The costs per-student were as low as about six dollars per year in the nationwide system to about thirty or thirty-five dollars per year for the other systems. These costs are approximate and rest on a variety of assumptions. More research is needed to determine these costs more accurately.

One assumption made in these estimates was the availability of a satellite video channel of the type able to transmit at a frequency capable of being received by inexpensive ground receivers. The cost of the satellite rental was found to be relatively insignificant in terms of the overall yearly cost. However, no rural project has yet reached the magnitude of scale, in terms of users, that was used in the calculations. A new nationwide satellite user consortium, the Public Satellite Service Corporation, has just been formed but it is as yet unclear what impact it will have on rural education.

It is unclear who would fund the initial capital investment needed to start a large scale telecommunications network for rural education. Satellite delivered television may be able to reach a reasonably inexpensive cost level given a sufficient audience size, but it is questionable whether financially overburdened rural schools could afford any additional cost, no matter how reasonable. The role of the federal government in the development and funding of telecommunications technology for rural education, remains an important question mark.

There are many precedents for federal aid to education. (25) Federal funds have been used to support experimental telecommunications for education as evidenced by the ATS-6 education experiments. The federal government often serves as a market aggregator and rural telecommunications seems an area appropriate for federal assistance.

Smaller scale telecommunications projects were discussed briefly. Initial capital costs are often less in smaller scale projects. Further research is needed to determine the benefits and costs of various resource sharing techniques, with and without telecommunications.

With approximately 14 thousand rural school districts it is clear that such a large number of separate entities raises questions of organization when discussing projects transcending local jurisdiction. The organizational structure, a key component of technological capability, is of primary importance. If schools are going to participate to any meaningful extent with large scale projects, autonomy must not be threatened. Control of telecommunications projects, especially large scale units, is critical as the needs of students must be guarded. What appears needed is some organization which would change the present organizational patterns, but would not threaten present sources of control. It seems clear that resource sharing beyond that common to all rural schools is needed, but it is not clear what form it should take, or the role of the federal government in the changes.

## FOOTNOTES

Chapter VI

1. Howard H. Hupe, "Cost-Effectiveness of an Interactive Broadcast Satellite" (Astronautics and Aeronautics, January, 1975) p. 63-67.

2. Thomas Stagl and others, Computer Aided Communication Satellite System Analysis and Optimization (St. Louis, Missouri: Center for Development Technology, Washington University, Report No. (R)T-73/2, October, 1973).

3. Robert Morley, "Alternative Network Designs for an Operational PLATO IV CAI System," M.S. Thesis, forthcoming, Washington University, Saint Louis, Missouri.

4. Hupe, op. cit.

5. Howard H. Hupe, "The Economics of a Satellite Delivery System for Open Learning and the Resulting Implications for Subject Matter and Learner Audience," a paper presented at the National Conference on Open Learning in Higher Education, January 16-18, 1974.

6. Hupe, 1975, op. cit.

7. Daniel C. Smith and James M. Janky, "Direct Broadcast Satellites" in A Direct Broadcast Satellite for Education in Africa, Stanford University, February 1973, p. 131.

8. Sidney G. Tickton, ed., To Improve Learning: An Evaluation of Instructional Technology, Vol. 1, New York, R. R. Bowker Co. 1970. Appendix C using information from: Clyde N. Carter and Maurice J. Walker, Costs of Installing and Operating Instructional Television and Computer Assisted Instruction in the Public School, Chicago, Booz, Allen and Hamilton, Inc., 1968.

9. Telephone interview with Ms. Georgianna Badaracca, Curriculum Coordinator, Project VI, December 15, 1974.

10. Lawrence P. Grayson, "Educational Satellites: The ATS-6 Experiments," The Journal of Educational Technology Systems (November, 1974).

11. Estelle Fuchs and Robert Havighurst, To Live on This Earth (New York: Doubleday and Company, 1972).

12. The Institute for the Development of Indian Law, Legislative Review, Vol. 2, No. 9, (1974).

13. Hupe, 1975, op. cit.

14. John Walkmeyer, Market Scenarios and Alternative Administrative Frameworks for Educational Satellite Systems, Center for Development Technology, Washington University, St. Louis, Missouri, forthcoming.

15. Ibid.

16. Ibid.

17. "Public Service Satellite Consortium Formed" JCET News, News Release, (January, 1975).

18. Philip L. Bourret, S. J., Television in Rural Areas; A Low Cost Alternative, (Menlo Park, California: International Educational Development, no date.)

19. Ibid.

20. Larry Otis and Wylie Wood, Town and Country Mobile Classroom; Mississippi State Module (Morehead, Kentucky: Appalachian Adult Basic Education Demonstration Center, Morehead State University, Sept. 30, 1970).

21. Lewis R. Tamblyn, Rural Education in the United States (Washington, D.C.: Rural Education Association, 1971). ED-054-884.

22. Ibid.

23. Ibid.

24. Phyllis E. Lehmann, "Teacher Training to the Road, Mobile Van, Computers Add Convenience and Quality to Continuing Education," Manpower (May, 1971).

25. Howard H. Hupe, "The Role of the Federal Government in Educational Applications of Satellite and Cable: A Normative Discussion," (presented at the Fourth Annual National Educational Technology Conference, San Francisco, CA., March 12-15, 1974).

# CHAPTER VII

# CONCLUSIONS

> This is new, and it is also very old. We have in a sense some full circle. We have come from the tyranny of the enormous, awesome, discordant machine, back to the realization that the beginning and the end are man - that it is man who is important, not the machine, and that it is man who accounts for growth, not just dollars or factories. Above all, that it is man who is the object of all our efforts.
>
> Pablo Casals

## Introduction

This thesis has examined the rural sector of the United States from the point of view of whether telecommunications technology can augment the development of rural education. Migratory farm workers and American Indians were the target groups which were examined as examples of groups with special needs in rural areas. The general rural population and the target groups were examined to identify problems and to ascertain specific educational needs.

Educational projects utilizing telecommunications technology in target group settings were discussed. Large-scale regional ATS-6 satellite-based experimental educational telecommunications projects were described. Costs and organizational factors were examined for large-scale rural telecommunications projects.

In this chapter, conclusions steming from this investigation are presented. Summaries of principal results from preceeding chapters are found at the end of each chapter.

The educational attainment level of the rural population is below the level experienced by the larger U.S. society. The educational level of the target groups is below the level of the United States average, as well as the average rural level. Further examination of demographic data revealed that rural areas in comparison to urban areas have lower income levels and a higher incidence of poverty. Small rural schools often have costs not found in larger schools due to certain diseconomies of scale and such factors as busing. Curriculum was found to be limited due to: the size of rural schools, disproportionately lower funding compared to urban areas, and teachers who were neither well trained nor well compensated. Very few programs were found which deal with culturally diverse groups who encounter great learning difficulties in school. The present situation is basically one in which many thousands of schools attempt to address unique groups of people by applying tradition-bound methods and obtain poor overall results.

Rural areas face the challenge of simultaneously raising the quality of education as well as the attainment levels. Improvements in literacy levels and vocational preparation are also needed. Meeting these needs will require better initial teacher preparation, further inservice training and increased specialization.

More and better course materials are needed in rural areas for both elementary and secondary education to reduce variations in quality from place to place. Some method appears needed to adjust the financial inequalities experienced in rural areas. Rural teachers need better compensation and a way must be found to finance cost overburdens experienced in the operation of rural schools.

Unique to migrants, yet important to the improvement of their education, is the need to have some coordinated educational curriculum among states, so that when migrants move from state to state they can maintain some semblance of continuity. The intermittent migrant school attendance caused by migration for employment and the resulting fragmented education has not been faced squarely. Migrants are able to take their culture and their educational needs with them as they move, but the educational establishment has not as yet been able to follow.

Bilingual education needs are found in both the American Indian population and segments of the migratory farm worker population. American Indian education is heading in a direction calling for more indigenous Indian control of education and for programs geared to Indian culture and interests.

The present educational system has not had to listen to the problems of Indians and migrants because they are poor, relatively small in number, and not able to provide strong financial support for education. The federal government has been the major force in striving for better quality in education for these special groups. The funding of migrant projects in education has caused a bonanza of programs to come forth since the inception of Title I in 1965. The federal government, through the Bureau of Indian Affairs and the Johnson-O'Malley Act has been the major funding source of Indian education.

Federal education programs have not achieved all of the goals for which their funding was intended. A recent study undertaken for the Department of Health, Education and Welfare to evaluate and assess the impact of Title I programs on migrant students concluded, as did this investigation, that a lack of coordinated planning and implementation of programs has resulted in duplication and gaps in the delivery of federally funded education services to migrants. (1)

## Resource-Sharing and Telecommunications

To deliver better quality education, rural education policy makers are faced with assembling, or reassembling, their teachers, funds, programs, and information more effectively. The general direction emerging is one of resource sharing beyond the magnitude presently experienced. Teachers, specialists, equipment, art work, and other techniques all need to be shared over larger areas without losing local school autonomy. Large-scale educational organizations can be formed to use central research and program production for widespread rural education distribution.

Telecommunications has much to offer in terms of resource-sharing for rural education. The ability to reach physically isolated populations; to teach and upgrade rural teachers; to share good teachers; to bring quality audio and visual information to the schools; to teach in bi-lingual, bicultural learning situations as well as to teach "mainstream" students; and to share administrations and computer services are all indications of the potential benefits that can be derived from telecommunications projects. Telecommunications can offer increased sharing of resources without the additional burden of increased travel expenses.

A small number of telecommunications based rural education projects were reviewed in this study which addressed migrant and Indian education. Radio, television, videotape and computer technologies were utilized in the projects. Most of the telecommunications-based rural education projects for Indians and migrants were able to utilize the technology to serve their goals and interests. Of those projects for which information was obtained, only Project VI, a videotape project for migrants in New Jersey, and the computerized Migrant Student Record Transfer System addressed rural students in any scale beyond local areas. Thus, many projects have not taken advantage of the opportunity offered by telecommunications to share resources over a much larger area and benefit more learners at relatively low costs. Public television no doubt has the potential for reaching many persons in the target group audiences but this area was not explored in this investigation.

Small-scale rural education telecommunications projects experienced fairly high per-user costs except in the case of radio. Ramah radio, an Indian project, enabled communication to take place between school and home that was otherwise nonexistent and thus helped reinforce school activities.

Three regional areas are presently participating in education experiments utilizing the NASA ATS-6 satellite. These experiments are funded by the federal government; NASA provided the satellite and the up-link, while NIE provided the ground hardware and educational development support. Participants include the Federation of Rocky Mountain States, the Appalachian Regional Commission and the State of Alaska. Teacher training, career education, and oral language development are the major foci of the ATS-6 programs. Organizational structures and communications hardware systems are also being tested. These ATS-6 experiments have indicated that it is now technically feasible to utilize electronic telecommunications technology to reach isolated rural areas with television signals of high quality. Satellite-based telecommunications systems are capable of efficient functioning irrespective of distances between receivers, a distinct advantage in rural education. A sufficient number of users is necessary to justify the high capital costs, however.

Costs of large-scale satellite-based educational telecommunications systems were examined and rough estimates of costs per-student were derived for four hypothetical rural systems corresponding to a) the rural Indian school population; b) the migrant student population; c) the Rocky Mountain rural student population, and; d) the entire rural public school population of the United States. The derived costs were in the neighborhood of thirty-five dollars per student school year, or less depending on: the number of users, the hours of programming and assumptions concerning programming and hardware costs. These costs represent only a few percent of the total presently expended per student for education in rural areas.

Large-scale cooperative educational approaches, however, require organization, planning, and coordination of programs, as well as personnel, methods, materials and information at a level presently unavailable in rural areas. It remains to be seen if the ATS-6 experiments will provide sufficient inducement to bring about the necessary organization and financial resources needed for continued efforts in the direction of large-scale satellite-based educational telecommunications systems. Further study and policy analyses are needed to determine if the benefits are worth the costs both financial and other.

This report's findings are in line with the conclusions of the study undertaken by the Developmental, Education and Training Research Institute (DETRI) (2) with respect to Indian education but in disagreement with respect to migrants. The DETRI study found, as did this one, that potential benefits stand to be derived from the use of instructional television (ITV) in Indian education. The DETRI study concluded, however, that ITV could be of little benefit to students from migrant farm worker families because of the inability of ITV to address problems of non-attendance caused by mobility and poverty. Satellite-based distribution networks have been found in this study to offer the potential of reaching migrants, despite their location, with a coordinated curriculum. A program coordinating curriculum across state lines for migrants might mitigate the piecemeal attendance problems.

The "New Rural Society" advanced by Peter Goldmark (3) has found potential for the application of telecommunications in rural development as this study has. It will be instructive to view Goldmark's "New Rural Society" results once some programs have been implemented. Perhaps, at that time, studies could be made, or further experiments conducted, to test the feasibility of such communications-based development on the smaller, more isolated rural areas which were the focus of concern in this study.

# FOOTNOTES

## Chapter VII

1. Exotech Systems, Inc., *Evaluation of the Impacts of ESEA Title I Programs for Migrant Children of Migrant Agricultural Workers* (Falls Church, Virginia: January 25, 1974) Vol. 1, ED-093-524, Vol. II, ED-093-525, Vol. III, ED-093-526, Vol. IV, ED-093-527.

2. Eva Mackin and others, *ITV and Education of Migratory Farm Workers, Indians, and Inner City Poor: Cross-Cultural Comparisons of International Uses of Media* (Washington, D.C.: Developmental Education and Training Research Institute, The American University, January, 1971).

3. Peter C. Goldmark, "Communications for a New Rural Society," *Journal of the SMPTE*, Vol. 8, (July, 1972).

# BIBLIOGRAPHY

# BIBLIOGRAPHY

Books:

Agee, James and Walker Evans. Let Us Now Praise Famous Men. Cambridge Massachusetts: Houghton Mifflin, 1960.

Allen, Steve. The Ground is Our Table. New York: Doubleday, 1966.

Cahn, E. Our Brother's Keeper: The Indian In White America. New York: World Publishing, 1969.

Coles, Robert. Uprooted Children: The Early Life of Migrant Farmworkers. Pittsburgh, Pennsylvania: University of Pittsburgh Press, 1970.

Coombs, L. Madison. The Educational Disadvantage of the Indian American Student. New Mexico State University, 1970.

Dawson, Howard A. and M. C. S. Noble, Jr. Handbook on Rural Education. Washington, D. C.: National Education Association of the U.S., 1961.

Freire, Paulo. Pedagogy of the Oppressed. New York: Herder and Herder, 1970.

Friedland, William H. and Dorothy Nelkin. Migrant: Agricultural Workers of America's Northeast. New York: Holt, Rinehart, Winston, 1971.

Fuchs, Estelle and Robert Havighurst. To Live on This Earth. New York: Doubleday and Company, 1972.

Illich, Ivan. Deschooling Society. New York: Harrow Books, 1971.

Kluckhohn, Clyde and Dorothea Leighton. The Navaho. New York: Doubleday and Company, Inc., 1962.

Matthiessen, Peter. Sal Si Puedes: Cesar Chavez and the New American Revolution. New York: Random House, 1969.

McLuhan, T. C. Touch the Earth. New York: Outerbridge and Dienstfrey, 1972.

McWilliams, Carey. Factories in the Field. Boston: Little, Brown and Company, 1939.

Meriam, Lewis. The Problem of Indian Administration. Baltimore, Maryland: John's Hopkins Press, 1928.

Moore, Truman E. The Slaves We Rent. New York: Random House, 1965.

Noble, M. C. S., Jr. and Howard A. Dawson. Handbook on Rural Education. Washington, D.C.: National Education Association, 1961.

Roessel, Robert A., Jr. Handbook for Indian Education. Los Angeles, California: American Publishing Company, no date.

Steinbeck, John. The Grapes of Wrath. New York: Viking Press, 1939.

Tamblyn, Lewis R. Rural Education in the United States. Washington, D.C.: Rural Education Association, 1971.

Tickton, Sidney G. (ed). To Improve Learning: An Evaluation of Instructional Technology. 2 Vols. New York: R. R. Bowker Company, 1970.

Wax, Murray L. Indian Americans: Unity and Diversity. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971.

Williams, Frederick and Geraldine Van Wart. Carrascolendas: Bilingual Education Through Television. Washington, D.C.: Praeger Publishers, 1974.

Wright, Dale. They Harvest Despair. Boston: Beacon Press, 1965.

Publications and Reports:

Alaska State Department of Education. The Big Picture on Small Schools. Juneau, Alaska, July 1972. ED-068-252.

Bourret, Philip L., S. J. Television in Rural Areas: A Low Cost Alternative. Menlo Park, California: International Educational Development, no date.

California State Department of Education. Education for Farm Migrant Children: Report on the Six-State Project for Developing State Leadership in Improving the Education Opportunities of Farm Migrant Children. Sacramento, California: California State Department of Education, 1971. ED-061-006.

California State Department of Education. Education for Farm Migrant Children. Sacramento, California, 1971.

________. California Plan for the Education of Migrant Children. Fiscal Year 1970. Sacramento, California, 1970.

Clements, William H. *Ideal High School Size: A Mirage in the Desert.* Wisconsin State University: Division of Instructional Research and Studies, 1970. ED-056-689.

Coles, Robert, M.D. *The Migrant Farmer: A Psychiatric Study.* Atlanta: Southern Regional Council, 1965.

Consulting Services Corporation. *Migrant Farm Workers in the State of Washington.* Seattle, Washington: Consulting Services Corporation, 1966.

Dyer, Maxwell. *Children of the Four Winds: The Migrant Student Record Transfer System.* Little Rock, Arkansas: Department of Education, April 1973. ED-087-456.

Edington, Everett D. "A Summary of Research in Rural Education." Testimony to the U.S. Senate Select Committee on Equal Educational Opportunity. Las Cruces, New Mexico: ERIC, Clearinghouse on Rural Education and Small Schools, September 1971. ED-053-842.

Education Commission of the States. *Early Childhood Programs for Migrants: Alternatives for the States.* Denver, Colorado, May 1972, p. 30. ED-063-966.

Exotech Systems, Inc. *Evaluation of the Impact of ESEA Title I Programs for Migrant Children of Migrant Agricultural Workers.* Falls Church, Virginia, January 25, 1974. Vol. I, ED-093-524. Vol. II, ED-093-525. Vol. III, ED-093-526. Vol. IV, ED-093-527.

Forbes, Jack D. *Native Americans of California and Nevada.* Berkeley, California: Far West Laboratory for Educational Research and Development, 1968.

Gardner, Rosemary and Carolyn Ingram. *The Yettem School Visual Literacy Project: English as a Second Language.* Los Angeles, California: Teacher Crops, Rural-Migrant, School of Education, University of Southern California, no date. ED-041-257.

Goldmark, Peter C. *The New Rural Society.* Ithaca, New York: Cornell University, 1973 University Lecture Series.

*Goodbye to the Great Divide.* Denver: Federation of Rocky Mountain States, Inc., 1973.

Goodwin, W. L. *Bucknell Conference on Learning Problems of the Migrant Child: Report of Proceedings.* Lewisburg, Pennsylvania: Bucknell University, 1967.

Greene, Shirley. *The Education of Migrant Children.* Washington, D.C.: National Education Association, 1954.

Heffernan-Cabrera, Patricia and others. Visual Literacy in the Classroom: The Camera as the Eye of the Mind. Los Angeles, California: Teacher Crops., Rural-Migrant, School of Education, University of Southern California, no date.

Hodgson, F. Kim. Ramah Navajo Radio Continuation Proposal. Ramah, New Mexico: mimeographed, April, 1973.

Hupe, Howard H. "The Economics of a Satellite Delivery System for Open Learning and the Resulting Implications for Subject Matter and Learner Audience." A paper presented at the National Conference on Open Learning in Higher Education. January 16-18, 1974.

________. "The Role of the Federal Government in Educational Applications of Satellite and Cable: A Normative Discussion." Presented at the Fourth Annual National Educational Technology Conference. San Francisco, California, March 12-15, 1974.

Jensen, Gerald M. Investigation of Occupational Training Needs of Migrant Workers Which May Point Toward Employment in Other than Migrant Employment. El Centro, California: Imperial County Schools, 1972. ED-065-262.

Kleinert, E. John and others. Migrant Children in Florida, Phase II. Report of the Florida Migratory Child Survey Project 1968-69. Coral Gables, Florida: Miami University, August 1969. ED-045-255.

Las Cruces Schools. Project Move Ahead. Las Cruces, New Mexico: mimeographed, undated. Provided by Dr. Alma Barba, Las Cruces, New Mexico, coordinator.

Mackin, Eva and others. ITV and Education of Children of Migratory Farm Workers, Indians, and Inner City Poor: Cross-Cultural Comparisons of International Uses of Media. Washington, D.C.: Developmental Education and Training Research Institute (DETRI), The American University, January 1971.

Michigan Employment Security Commission. 1970 Farm Labor and Rural Manpower Report. ED-051-939.

Morgan, Robert P. and others. Large-Scale Educational Telecommunications Systems for the U.S.: An Analysis of Educational Needs and Technological Opportunities. St. Louis, Missouri: Center for Development Technology, Washington University, forthcoming.

National Committee on the Education of Migrant Children. Summary and Fact sheet on Wednesday's Children: A Report on Programs Funded Under Title I of the ESEA. 145 East 32nd Street, New York: National Committee on the Education of Migrant Children, March 1971.

National Committee on the Education of Migrant Children. The Educational Problems of the Migrant Child. 145 E. 32nd Street, New York: mimeographed booklet, N.C.E.M.C., undated.

________. "Study Finds Agriculture Still Relys on Child Labor." FOCUS, (occasional newsletter), No. 12. New York: National Committee on the Education of Migrant Children, March 1971.

Office of Migrant Education. Pilot V. New Jersey: Department of Education, 107 W. State Street, Trenton, New Jersey, mimeographed, no date.

Otis, Larry and Wylie Wood. Town and Country Mobile Classroom: Mississippi State Module. Morehead, Kentucky: Appalachian Adult Basic Education Demonstration Center, Morehead State University, September 30, 1970.

Palm Beach County Board of Public Instruction. FM Radio: An Oral Communication Project. West Palm Beach, Florida: 1971. ED-061-739.

Parker, Walter B. Village Satellite II: The Second Evaluation of Some Educational Uses of ATS-1 Satellite Education Broadcasting in Alaska. 3724 Campbell Airstrip Road, Anchorage, Alaska, July 1973.

Pierce, James M. The Condition of Farm Workers and Small Farmers in 1971. New York: National Sharecroppers Fund, 1972.

Polcyn, Kenneth A. An Educator's Guide to Communication Satellite Technology. Washington, D.C.: Academy for Educational Development, Inc., September 1973.

School Board of Palm Beach County, Department of Learning Resources. "Audience Survey 1974." Boynton Beach, Florida: WHRS/FM, School Board of Palm Beach County, mimeographed 1974.

Smith, Daniel C. and James M. Janky. "Direct Broadcast Satellites" in A Direct Broadcast Satellite for Education in Africa. Stanford University, February 1973.

Stagl, Thomas and others. Computer-Aided Communication Satellite System Analysis and Optimization. St. Louis, Missouri: Center for Development Technology, Washington University, Report No. (R)T-73/2, October, 1973.

Texas Education Agency. Annual Report of the Texas Child Migrant Program 1971-72. Austin, Texas, December 1972.

________. Texas Child Migrant Program. Austin, Texas: Texas Education Agency, Fall 1972.

______. Texas Small Schools Project 1969. Austin, Texas: Texas Education Agency, March, 1970. ED-056-787.

Texas Good Neighbor Commission. 1969 Texas Migrant Labor Annual Report. Austin, Texas, 1970.

______. Texas Migrant Labor 1970 Annual Report. Austin, Texas, 1971.

______. Special Report 1970. Austin, Texas, 1971.

Thomasson, LaVerne B. and Maurice E. A Demographic Study of Farm Migrants in Delaware. Dover, Delaware: Vocational-Technical Division, Delaware Department of Public Instruction, September 1969. ED-023-522.

WHRS/FM. Program Guide. Boynton Beach, Florida: School Board of Palm Beach County, mimeographed, 1974.

Walkmeyer, John. Market Scenarios and Alternative Administrative Frameworks for Educational Satellite Systems. St. Louis, Missouri: Center for Development Technology, Washington University, forthcoming.

U.S. Government Documents:

Bela, Richard "Structure of the Farm Labor Market." U.S., House of Representatives, Hearings of the House Subcommittee on Agriculture Labor, June 10, 1971. Washington, D.C.: Government Printing Office, 1971.

Berry, Brewton. The Education of American Indians. Washington, D.C.: U.S. Government Printing Office, 1969.

Epstein, Lenore. "Migrant Farm Workers." Social Security Administration Bulleton, No. XXVI. Washington, D.C.: Government Printing Office, 1963.

Harris, Marshall. Entrepreneurial Control in Farming. U.S. Department of Agriculture, ERS No. 542. Washington, D.C.: Government Printing Office, 1974.

"Health-Education Telecommunications Experiment (HET): Experiment Summary Description." Washington, D.C.: Department of H.E.W. and N.A.S.A, November 1, 1973.

Lippin, Susan A. "Developments in Farm Labor Unionization." Rural Manpower Developments. Issued by Rural Manpower Service, U.S. Department of Labor, Sept/Oct 1971. Washington, D.C.: Government Printing Office, 1971.

McElroy, Robert C. "Agriculture Manpower Needs and Opportunities." Remarks before the Northeast Farm Labor Research Committee. McAllen, Texas: copies distributed by the U.S. Department of Agriculture, Dec. 12, 1972.

________. The Hired Working Force of 1971. U.S. Dept. of Agriculture, Economic Research Service, Agri. Econ. Report No. 222. Washington, D.C.: Government Printing Office, March 1972.

________. Economic Research Service, U.S. Department of Agriculture, "Migratory Farmworker Problems and Needs." Talk before the National Manpower Advisory Committee. Washington, D.C.: copies distributed by the Department of Agriculture, June 18, 1971.

National Science Foundation. Technological Innovation in Education, 1974 Awards. Washington, D.C.: National Science Foundation, Office of Experimental Projects and Programs, mimeographed 1974.

The President's National Advisory Commission on Rural Poverty. The People Left Behind. Washington, D.C.: Government Printing Office, 1967.

Rapton, Avra. Domestic Migratory Farmworkers; Personal and Economic Characteristics. U.S. Dept. of Agriculture Report No 121. Washington, D.C.: Government Printing Office, September 1967.

Task Force on Rural Education. Report of Task Force on Rural Education. U.S. Office of Education, (DHEW). Washington, D.C.: Government Printing Office, 1969. ED-051-921.

U.S., Department of Commerce. Bureau of Census. 1970 Census. Washington, D.C.: Government Printing Office.

________. Subject Report PC(2)-C1: General Social and Economic Characteristics. Washington, D.C.: Government Printing Office.

________. Subject Report PC(2)-D1: Detailed Characteristics. Washington, D.C.: Government Printing Office.

________. Subject Report PC(2)-1D: Persons of Spanish Surname. Washington, D.C.: Government Printing Office.

________. Subject Report PC(2)-IF: Indian Americans. Washington, D.C: Government Printing Office.

________. Subject Report PC(2)-54: School Enrollment. Washington, D.C.: Government Printing Office.

________. Subject Report PC(2)-94: Low Income Population. Washington, D.C.: Government Printing Office.

________. 1969 Census of Agriculture. "Farms: Number, Use of Land, Size of Farm." Washington, D.C.: Government Printing Office.

U.S. Department of Health, Education and Welfare. *Children at the Crossroad*. Title I E.S.E.A. Report. Washington, D.C.: Government Printing Office, 1970.

_______. Office of Education. *Digest of Educational Statistics, 1972 Edition*. Washington, D.C.: Government Printing Office, 1973.

_______. Office of Education. *Directory of Consultants on Migrant Education*. Washington, D.C.: Government Printing Office, Dec. 1970. ED-045-277.

_______. Office of Education. *Projection of Educational Statistics to 1981-1982*. Washington, D.C.: Government Printing Office, 1973.

U.S. House of Representatives. House Subcommittee on Agriculture Labor. Hearing 92nd Congress, June 1971. Washington, D.C.: Government Printing Office.

U.S. Department of the Interior. Bureau of Indian Affairs. Office of Education Programs. *Statistics Concerning Indian Education Fiscal Year 1972*. Washington, D.C.: Government Printing Office.

_______. *Budget Estimates*, Fiscal Year 1975. Washington, D.C.: Government Printing Office.

U.S. Department of Labor and U.S. Department of H.E.W. *Domestic Agriculture Migrants in the United States*, Public Health Publication No. 540. Washington, D.C.: Government Printing Office.

U.S. Department of Labor. *National Migrant Worker Program Handbook*. Washington, D.C.: Government Printing Office, mimeographed, March 1972.

U.S. President 1969-74 (Richard M. Nixon). *Message to Congress*, July 8, 1970, Document No. 91-363. Washington, D.C.: Government Printing Office, 1970.

U.S. Senate. Subcommittee Hearings. *Migratory and Seasonal Farmworker Powerlessness*. Washington, D.C.: Government Printing Office, 1970.

U.S. Senate. Subcommittee on Indian Education of the Committee of Labor and Public Welfare. Hearing 91st Congress, 1st Session. Washington, D.C.: Government Printing Office.

## Periodicals:

Ayres, Mary Ellen. "Native Americans Find New Uses for Radio-TV," *Cablelines*, Vol. 2, No. 2, February 1974.

Barnes, Peter. "The Future of the United Farm Workers; Chavez Against the Wall," *The New Republic*, December 7, 1974.

Burnett, Donald L. Jr. "An Historical Analysis of the 1968 Indian Civil Rights Act," Harvard Journal on Legislation, Vol. 9, No. 4, May 1972.

Fuchs, Estelle. "Time to Redeem an Old Promise," Saturday Review, January 24, 1970.

Gibbons, Michael and Roger Voyer. "Technology Assessment: Bias-Free Analysis," New Scientist, New Science Publications, London, Vol. 58, No. 847, May 24, 1973.

Givens, Richard A. "Legal Disadvantages of Migratory Workers," Labor Law Journal, September 1965.

Goldmark, Peter C. "Communications for a New Rural Society," Journal of the SMPTE, Vol. 81, July 1972.

Grayson, Lawrence P. "Educational Satellites: The ATS-6 Experiments," The Journal of Educational Technology Systems, November 1974.

Hupe, Howard H. "Cost-Effectiveness of an Interactive Broadcast Satellite," Astronautics and Aeronautics, January, 1975.

Lehmann, Phyllis E. "Teacher Training Takes to the Road, Mobile Van, Computers Add Convenience and Quality to Continuing Education," Manpower, May, 1971.

North, Davis S. "U.S. Government Moving to Cut Back Immigration from Mexico," AGENDA, Washington, D.C.: National Council on LaRaza, Winter, 1973.

Samora, Julian. "Immigration History Provides Key, AGENDA, Washington, D.C.: National Council of La Raza, Winter, 1973.

Seaborg, Glenn T. "Science, Technology and Development: A New World Outlook," Science, Vol. 181, No. 4094, July 6, 1973.

Wade, Nicholas. "Agriculture: Social Sciences Oppressed and Poverty Stricken," Science, May 18, 1973.

"Census Bureau Unveils Revised Count on U.S. Spanish Speaking," AGENDA, National Council of La Raza, Vol. IV, No. 3, March 1974.

"Public Service Satellite Consortium Formed," Joint Council on Educational Telecommunications News, Special News Release, January, 1975.

The Institute for the Development of Indian Law, Legislative Review, Vol. 2, No. 9, 1974.

"Interactive Satellite: ATS-6 Brings People Together," Broadcast Management Engineering (BME), November, 1974.

U.S., Supreme Court, Saxbe v. Bustos, No. 73-300 and Cardona v. Saxbe, 73-480, decided November 25, 1974. Mr. Justice Douglas delivered the opinion. U.S. Supreme Court Bulletin, New York: Commerce Clearing House, Inc., issued continuously.

## Theses:

Morley, Robert. "Alternative Network Designs for an Operational PLATO IV CAI System." M.S. Thesis, Washington University, Saint Louis, Missouri, forthcoming.

Perrine, Jay Randal. "Negroes Between Crops and Whites: A Cultural Study of Negro Migratory Farm Workers of the East Coast Stream." Bachelor's Thesis, Goddard College, Copyright June, 1969.

Veloz, Felipe. "Factors Related to Usage of the Migrant Student Record Transfer System in Five States with High Migrant Concentrations. Unpublished Doctor of Education dissertation, New Mexico State University, Las Cruces, New Mexico, July, 1973. ED-078-976.

## Correspondence, Interviews, Telephone Calls:

Correspondence with Winifred Miller, Administrator, Migrant Student Record Transfer System, Little Rock, Arkansas, April 25, 1973.

Personal interview with Ben Fogletto, administrator and Georgianna Bodaracca, Curriculum Coordinator, Pilot V, March 29, 1973.

Personal interview with Mike McFarland, October 15, 1973, Isleta, New Mexico.

Personal interview with Francis Mansfield, October 15, 1973, Isleta, New Mexico.

Personal interview, Ernest Lavato, October 15, 1973, Albuquerque, New Mexico.

Personal interview with Dr. Alma Barba, October 16, 1973, Las Cruces, New Mexico.

Personal interview with Gerald T. Wilkinson, Executive Director, National Indian Youth Council, Inc., Albuquerque, New Mexico, October 16, 1973.

Personal interview with Ralph Casteel, Communication Director, Navajo Nation, October 19, 1973, Window Rock, Arizona.

Telephone conversation with Ben Fogletto, administrator, October, 1973.

Telephone interview with Ms. Chon LaBrier, Assistant Principal, Dulce School, Dulce, New Mexico, May, 1974.

Telephone interview with Ms. Pat O'Meara, public relations director, WHRS-FM, Boynton Beach, Florida, December 6, 1974.

Telephone interview with Ms. Geogianna Badaracca, Curriculum Coordinator, Project VI, December 15, 1974.

Telephone interview with Mrs. Horner, Migrant Programs, Fiscal Office, U.S. Department of Health, Education and Welfare, October 30, 1974.

# APPENDIX

# APPENDIX I

## FIELD VISIT ITINERARY

October, 1973

October 15, 1973

- Dr. Eugene Leitka
  Education Evaluation Unit
  Bureau of Indian Affairs
  Albuquerque, New Mexico

- Ms. Katherine Redcorn, B.I.A., Albuquerque.

- Mr. Paul Strief, B.I.A., Albuquerque.

- Visit Isleta Pueblo with Dr. Leitka
  Isleta, New Mexico

- Mr. Francis Mansfield, Principal
  Isleta Elementary School, Isleta, New Mexico

- Mr. Michael McFarlan, Technician/Teacher
  Isleta CAI Project

- Site Visit to Jemez Pueblo with Dr. Leitka

October 16, 1973

- Ernest L. Lovato, Executive Director of Communications
  All Indian Pueblo Council, Inc.
  Albuquerque, New Mexico

- Gerald T. Wilkinson, Executive Director
  National Indian Youth Council, Inc.
  Albuquerque, New Mexico

- Dr. Thomas R. Hopkins, B.I.A., Albuquerque

- Mr. Curtis Shultz
  Telecommunications Consultant to
    Ramah Radio and the
    All Indian Pueblo Council

October 17, 1973

- Mr. Raul Houlguin, Migrant Coordinator
  Las Cruces Public Schools, Area I, Las Cruces, New Mexico

- Mrs. Betty Rose Rios, Acquisitions
  ERIC/Clearninghouse on Rural Education
  and Small Schools
  New Mexico State University
  Las Cruces, New Mexico
- Dr. Alma Barba, former Coordinator
  Project Move Ahead, Las Cruces, New Mexico
- Visit of KWRG facilities with Dr. Barba
- Site visit of Mexican-American and Filipino farm workers in the fields

October 18, 1973

- Kim Hodgson, KTDB Radio Station
  Ramah Radio Project,
  Ramah, New Mexico
- Sam Martinez, Ramah High School
- Thomas Cummings
  Ramah High School, Ramah, New Mexico
- Zuni Reservation Visit

October 19, 1973

- Visit Navajo Community College
  Tsaile, Arizona
- Ralph Casteel, Communications Director
  Navajo Tribal Council
  Window Rock, Arizona
- Lee Kiyaani, Assistant Principal
  Rough Rock Demonstration School
  Rough Rock, Arizona

October 20, 1973

- Visit Hopi Reservation

October 23, 1973

- Dr. Louis Bransford, Utilization
- Dr. James Janky, Research and Development
- Mr. Toly Fliakos, Production
  Federation of Rocky Mountain States
  Denver, Colorado